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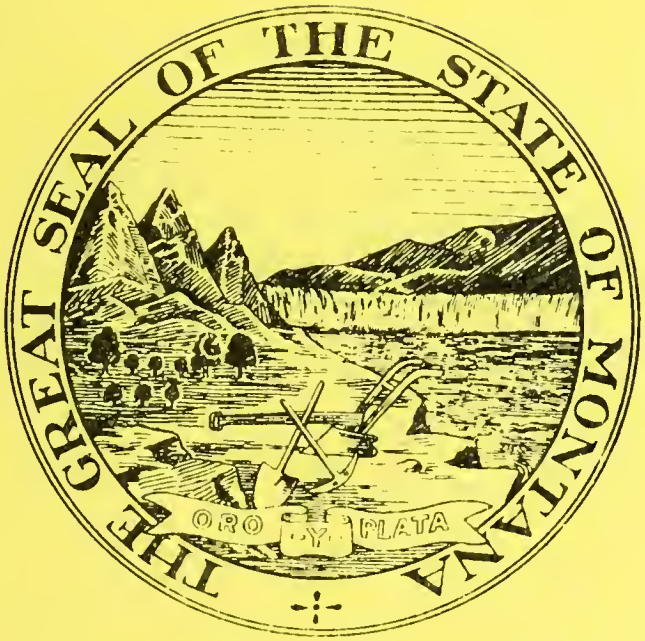
MONTANA HISTORICAL ENERGY STATISTICS



THOMAS L. JUDGE, GOVERNOR

MONTANA ENERGY ADVISORY COUNCIL
STATE CAPITOL
HELENA, MONTANA 59601

LT. GOVERNOR BILL CHRISTIANSEN, CHAIRMAN

MSU DEC 8 '78

MONTANA HISTORICAL ENERGY STATISTICS

Prepared By

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Montana Energy Advisory Council

September 1976

MONTANA ENERGY ADVISORY COUNCIL
STATE CAPITOL
HELENA, MT 59601

BILL CHRISTIANSEN, CHAIRMAN

September, 1976

The Honorable Thomas L. Judge
Members of the Legislative Assembly
The People of Montana

In August of 1975, Governor Judge directed the Montana Energy Advisory Council to formulate a comprehensive energy conversion policy and plan as called for in House Bill 453 passed by the 1975 Legislature. In that assignment to the Montana Energy Advisory Council, Governor Judge called for a comprehensive assessment of the energy data situation for Montana, including a detailed inventory of all energy data available from state and federal sources, an up-to-date summary of the most important data, and specific recommendations for a continuing energy data storage, retrieval and analysis program.

This report comprises the inventory and summary portions of that assignment. It contains under one cover the most comprehensive summary of energy data ever prepared for the State of Montana. We cannot formulate meaningful energy policies without knowing where we are and how we got here. This report is a major step in that direction.

It is intended to be a factual and nonjudgmental document, and in keeping with this intent, our policy recommendations regarding a continuing energy data and analysis program will be transmitted separately.

Constructive criticism and comments will be appreciated.

Respectfully submitted,

Bill Christiansen

Bill Christiansen
Lieutenant Governor

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FOREWORD

This document has been prepared to assemble a set of historical energy statistics for the State of Montana. The data primarily have been drawn from reports previously published by several agencies. Statistics presenting the reserves, production, consumption, processing, and prices of natural gas, crude petroleum and petroleum products, coal, electricity and uranium in Montana are included. Some comparative data for the nation are also included; however, no thorough attempt has been made to completely document the national energy situation.

The reader should note that differences do exist for many data elements among the reports from various agencies. However, most differences are only a few percent in magnitude, and can be expected to result from different data collection and reporting procedures. The Appendix presents notes to the data tables and descriptions of various data elements, to the extent that they are known at this time. Every attempt has been made to include the most current data available. A map of Montana oil and gas fields, pipelines, and refineries also has been included, courtesy of the Montana Department of Natural Resources and Conservation, Oil and Gas Conservation Division.

Publication of this document would have been impossible without the long-standing efforts of those agencies, federal state and private, which have compiled and published the statistics that are assembled here. For principal responsibility in assembling this publication, we wish to thank Terry Wheeling, Montana Energy Advisory Council staff analyst. The comments and suggestions of those who reviewed preliminary versions of this document are also sincerely appreciated.

I. SUMMARY

Since the Arab oil embargo of late 1973, the energy situation of the United States has been the focus of much analysis and comment. The importance of energy to the nation and to the State of Montana was very real long before this point of public and governmental revelation. The significance of energy in the American life style has been steadily increasing over the past several decades. Now, in this time of supply uncertainty for both the nation and Montana, energy is critically important. The availability of energy in Montana and the level of energy development within the state will have significant impacts on Montana's residents, economy and environment. It is imperative that both government decision-makers and the public have an understanding of the state's energy situation and that this understanding be based on the most comprehensive, factual and current information available. As one of the first steps towards energy education, this document has been prepared to assemble a comprehensive set of historical energy statistics for the State of Montana. The student of Montana's energy situation will recognize both the complexity of the issue, often compounded by conflicting sources of information, and the current lack of data for many pieces of the energy picture. It is hoped that the statistics presented here will provide the beginnings of an expanding energy data base that can be utilized to build the understanding necessary for rational decision making in the energy arena.

This summary chapter has been prepared to provide a brief overview of the statistics that follow, and to reflect a current perception of the energy situation in Montana. It is intended to supplement the extensive data tables, presented in Chapters II through VII, by relying on general graphical displays and a minimum of numerical information.

Overview

Montana has been richly endowed with substantial energy resources. Significant volumes of natural gas and crude oil, as well as massive deposits of subbituminous coal and lignite, are known to exist beneath much of the state. Coal accounts for over 99 percent of the known fossil fuel reserves in Montana, a fact that underscores the significant part that coal will play in the energy future of the state. (See Figure 1.1) In addition, Montana's major rivers provide an important source of energy for the production of electricity.

Montana historically has been an intensively resource extractive state. The abundant energy reserves of the state have been and continue to be drawn upon at significant levels; per capita production of energy in Montana during 1974 was about 2.8 times that of the nation as a whole. This substantial development of

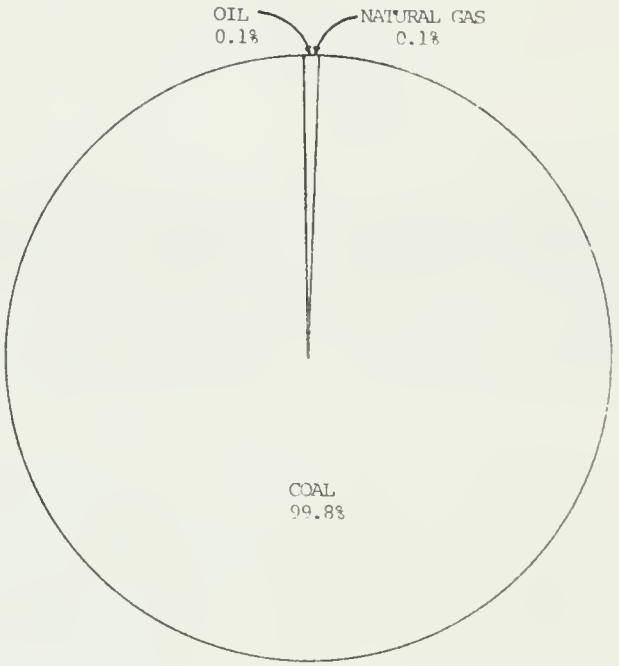

Figure 1.1: Economically Recoverable Reserves of Fossil Fuels in Montana as of December 31, 1974 (1)

fossil fuel resources now has made Montana a large exporter of fossil fuel energy. But, even though Montana produces almost two and one-half times as much energy as the state consumes, large and very important quantities of energy are imported from neighboring states and Canada. Of course, not all forms of energy are immediately interchangeable, due to physical, environmental and economic differences between various fuels.

The simultaneous export and import of fuels is due to several factors, among which are resource ownership patterns and limitations due to existing transportation facilities (particularly crude oil pipelines). Varying peak demands for electricity in the region also make Montana both an importer and exporter of electrical energy. In addition, the oil refineries in Montana, concentrated in the Billings area, export large volumes of refined petroleum products to neighboring states.

Figure 1.2 shows a comparison of 1975 production, consumption, imports and exports of fossil fuel energy in Montana. Several important observations can be made from this diagram. Production and exports of energy clearly are dominated by the recent coal development in the state. In the past two years, coal has replaced

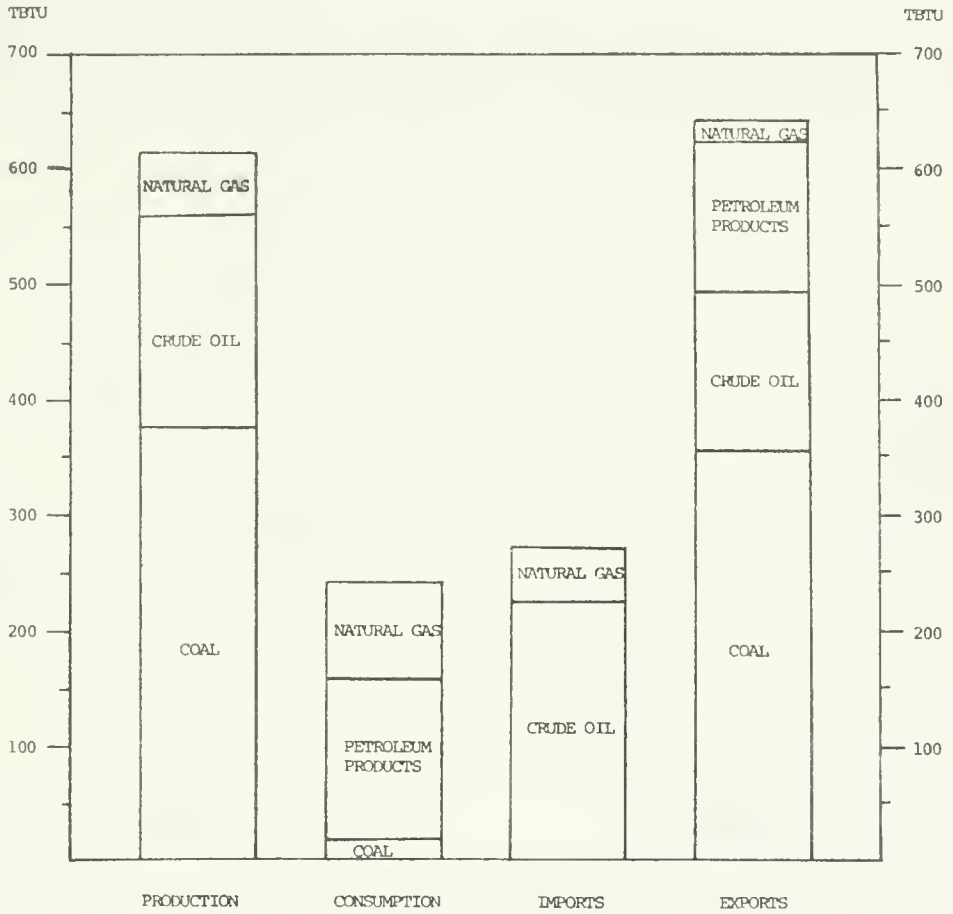

Figure 1.2: Production, Consumption, Imports and Exports of Fossil Fuels in Montana in 1975
(In Trillion British Thermal Units)

crude oil as the major form of energy production in Montana. (See also Figure 1.5, Page 5.) Also of great importance and concern are the large imports of crude oil and natural gas, most of which come from Canada and at this time are very uncertain sources for the future. Further, it should be noted that fossil fuel exports in fact exceeded the state's production in 1975, due to the export of petroleum products refined largely from imported crude oil.

Despite the immense coal reserves of Montana and the recent increases in coal production in this state, coal continues to provide a very small percentage of the energy consumed in Montana, accounting for about 7 percent of total energy consumption in 1975. Petroleum products provide the largest energy source in Montana, as is also the case for the nation. Consumption of petroleum products is dominated by the use of motor gasoline for private and commercial transportation. The transportation sector is the largest consuming sector in Montana, with the remainder of energy use almost equally split between the industrial sector and the combined

residential/commercial sector. Industry in Montana, over the past decade, has been the fastest growing energy consuming sector, and also the most variable. Energy use by Montana's industries is highly concentrated in a very few consumers, most notably in the production of copper and aluminum.

Figure 1.3: Production and Consumption of Energy in Montana in 1975 (2)
(In Trillion British Thermal Units)

Even though energy consumption in Montana is small compared to the state's production, it is by no means insignificant. (See Figure 1.3) Gross consumption of energy (3) per capita in Montana in 1974 was about 440 million British Thermal Units (BTUs), or the energy equivalent of 3,500 gallons of gasoline used for every person in the state. This is significantly greater than the national average per capita gross consumption of 340 million BTUs, primarily due to the greater concentration of industry per capita in Montana compared to the nation. Per capita consumption of energy in Montana grew at a rate of about 3 percent per year from 1960 to 1970, slowing to around 2 percent per year from 1970 to 1973, and grew at a still slower pace from 1973 to the present at below 1 percent per year. This trend has been influenced by many variables including recently rising energy prices, conservation, and the nationwide slowdown in economic activity. Figures 1.4 through 1.7 show the consumption and production of energy in Montana for the period 1960 to 1975.

Figure 1.4: Production and Consumption of Energy in Montana
(In Trillion British Thermal Units)

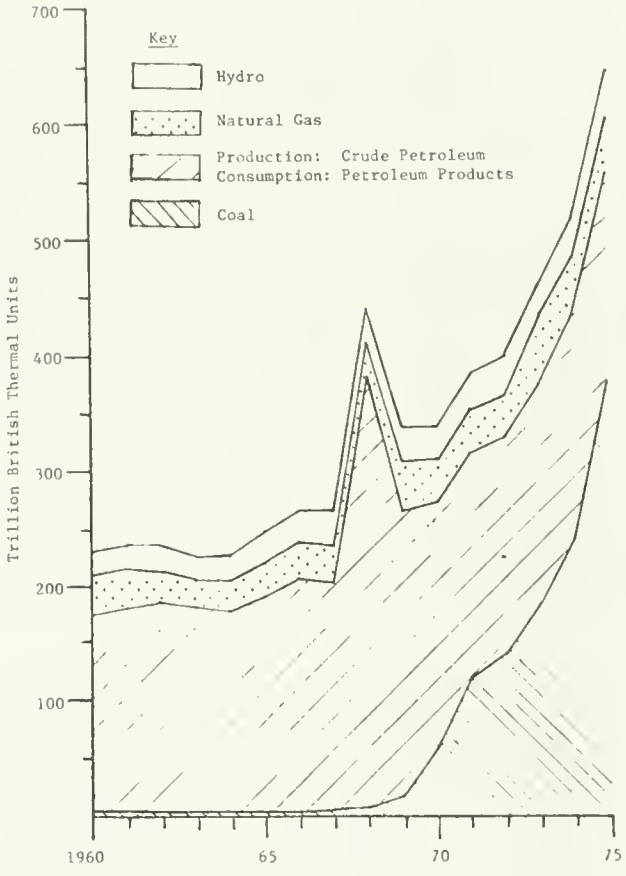

Figure 1.5: Production of Energy in Montana, By Type of Fuel (2)
(In Trillion British Thermal Units)

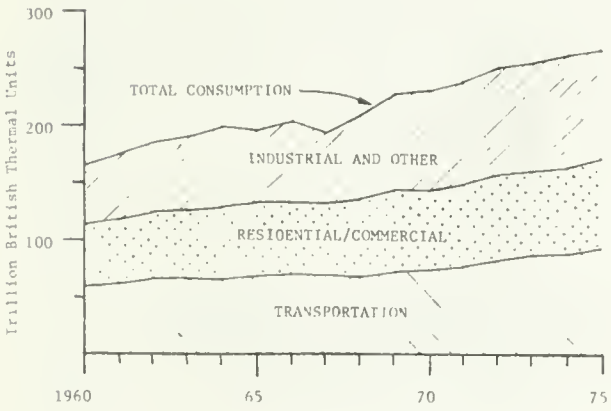

Figure 1.6: Consumption of Energy in Montana, By Sector
(In Trillion British Thermal Units)

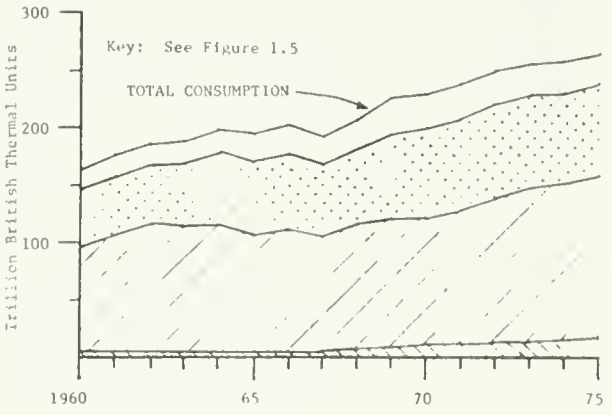

Figure 1.7: Consumption of Energy in Montana, By Type of Fuel (2)
(In Trillion British Thermal Units)

Natural Gas

Known reserves of natural gas in Montana are located predominantly in the eastern and northcentral portions of the state. The American Gas Association estimates that as of December 31, 1975, total proven recoverable reserves of natural gas, including storage in Montana, were 929.986 billion cubic feet (bcf). At the 1975 level of production and net withdrawal from storage of 53.5 bcf, these known reserves would be depleted in 17 years. Recent discoveries of deep gas in the disturbed belt along the Rocky Mountains in Wyoming coupled with recurring rhetoric favoring Federal Power Commission deregulation of interstate gas prices (which should provide more incentive for exploration and production) give some cause for hope that additional reserves will be discovered and brought into production. However, there is no mechanism for locking new finds into exclusive use in Montana, so that a major new discovery could make Montana a large exporter of natural gas.

These factors, in addition to recent cutbacks in imports of natural gas from Canada, have caused great uncertainty and concern for the state's natural gas supply. As can be seen in Figure 1.8, consumers in Montana depend heavily on imports of natural gas. The state is particularly dependent on Canada, and to a lesser degree on Wyoming and North Dakota, for its gas supply.

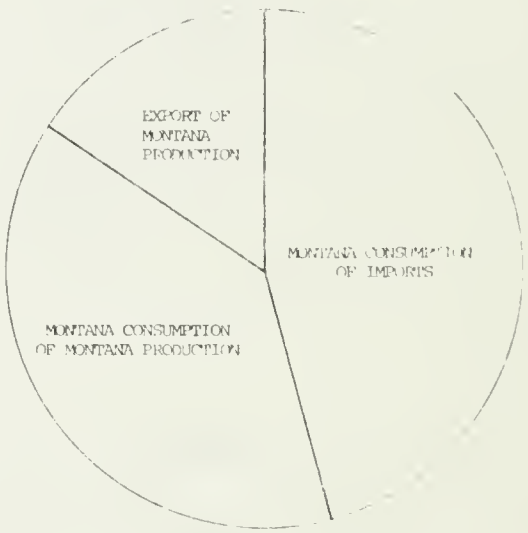

Figure 1.8: Supply of Natural Gas in Montana in 1975 (4)

The state is served by two major utilities: the Montana Power Company (MPC) which provides about 64 percent of total natural gas sales directly to the western two-thirds of the state, with an additional 9 percent of total sales distributed through other utilities; and Montana-Dakota Utilities which provides service to the remaining one-third of the state, with about 26 percent of total Montana natural gas sales. In addition, nine other utilities distribute gas in Montana. Northern Natural Gas Company, since 1972, has been exporting gas produced in the Tiger Ridge area of Hill and Blaine Counties to Minnesota.

In addition to Montana gas production, the MPC system utilizes supplies of natural gas produced in two areas of Alberta:

-- The Carway fields of Southwestern Alberta for which existing contracts allow purchases of 29.2 bcf per year. These contracts will begin expiring in 1985, with some remaining in effect until 1993.

-- The Aden fields in Southeastern Alberta which have historically provided 18 to 20 bcf per year. Approximately 70 percent of the Aden gas has been from MPC production, with the remaining 30 percent purchased from independent producers. Current gas exports from this area are limited to about 5 bcf per year.

The import of Canadian natural gas to Montana began in 1952, increased steadily to an annual maximum of 50 bcf in 1973, and has decreased since to 42.2 bcf in 1975. Since 1973, the Canadian National Energy Board has set maximum annual natural gas export volumes. These quotas are reviewed each year, and have been steadily reduced. The most recent export authorization for the Montana Power Company is 34.2 bcf from May 1976 to May 1977. Canadian natural gas is extremely important to the MPC system, accounting for about 73 percent of their total sales in 1975 (including sales for resale, excluding inputs from storage facilities). In response to Canadian export limitations, production of natural gas in Montana by the Montana Power Company has increased to almost 15 bcf during 1975. An additional 65 bcf of gas reserves will begin to supply the MPC system with about 6 bcf per year, with the completion of the Lone Star pipeline in the Fall of 1976.

Montana-Dakota Utilities (MDU) draws on the natural gas resources of North Dakota, South Dakota, Wyoming and Montana for delivery in those states. Figure 1.9 shows the role that each state plays in the production and consumption of gas within the MDU system for a recent 12-month period (April 1, 1975, to March 31, 1976). Wyoming is both the largest producer and smallest consumer of gas in the system; inputs of natural gas from South Dakota are negligible. On a net basis within the MDU system, Montana contributed almost as much as as was consumed in the state for this time period. However, this does not reflect the degree to which Montana-produced gas moves out of state within the system, and is in turn replaced primarily by gas from Wyoming. Montana's substantial share of total system production is particularly due to the large underground natural gas storate area in the Baker field of Eastern Montana. This storage facility has been very important to the MDU

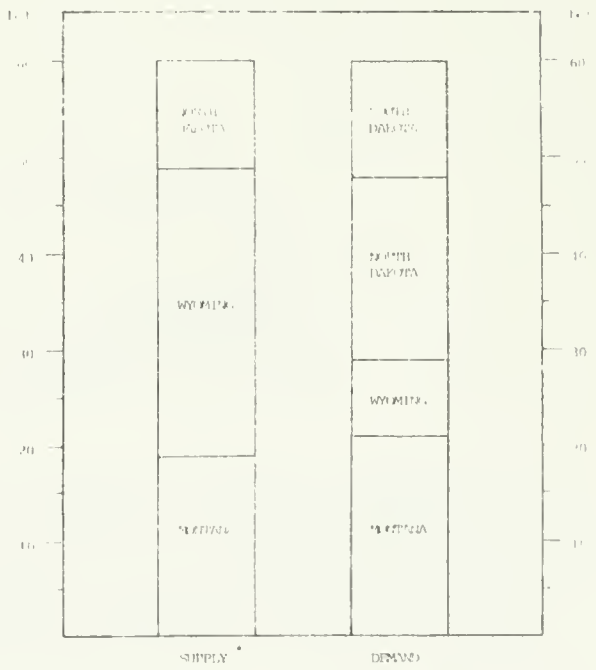

Figure 1.9 Supply and Demand for Natural Gas in the Montana-Dakota Utilities System by States, 4/1/75 - 3/31/76 (billion cubic feet)

* Production [illegible] in South Dakota was negligible for this period

system, allowing winter peak demands to be met by stored gas with the storage replenished during lower summer demands. However, since 1972 a net annual withdrawal of gas from storage has occurred, which if continued may soon begin to place a strain on the system's ability to meet demand.

Production of natural gas in Montana, excluding Tiger Ridge production dedicated to export, declined at an average rate of 5 percent per year from 1970 to 1975. Figure 1.10 combines the supply of natural gas for all gas utilities in Montana, except Northern Natural Gas Company exports, and indicates that portion which comes from Montana production, net domestic imports, and net Canadian imports for 1954 to 1975.

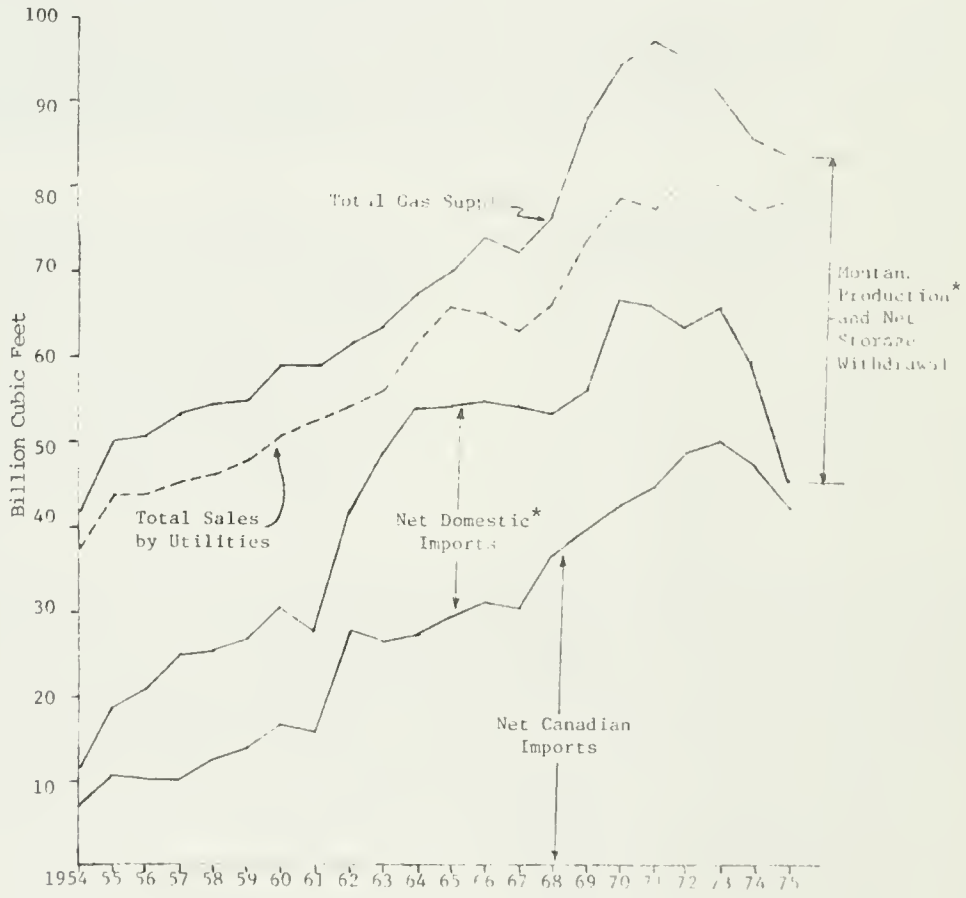

Figure 1.10: Supply of Natural Gas in Montana, by Source Region, 1954-1975

* excludes exports by Northern Natural Gas Co. from Tiger Ridge area.

Figure 1.11 shows total Montana production and that portion of total production which has been exported from Montana by Northern Natural Gas Company.

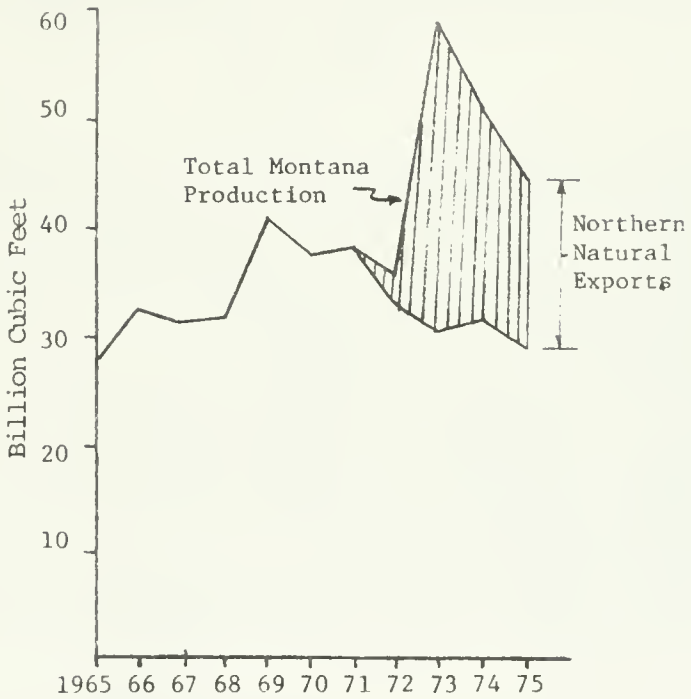

Figure 1.11: Montana Natural Gas Production and Exports by Northern Natural Gas Co., 1965-1975

Natural gas consumption has increased significantly over the past two decades in Montana. The industrial sector has shown the fastest growth in gas use, and is the largest and most variable consuming class. About 76 percent of industrial gas use is within the Montana Power Company system, and is heavily concentrated in a very few industries. Figure 1.12 shows the total sales of natural gas in Montana and a breakdown of sales to the major consuming classes.

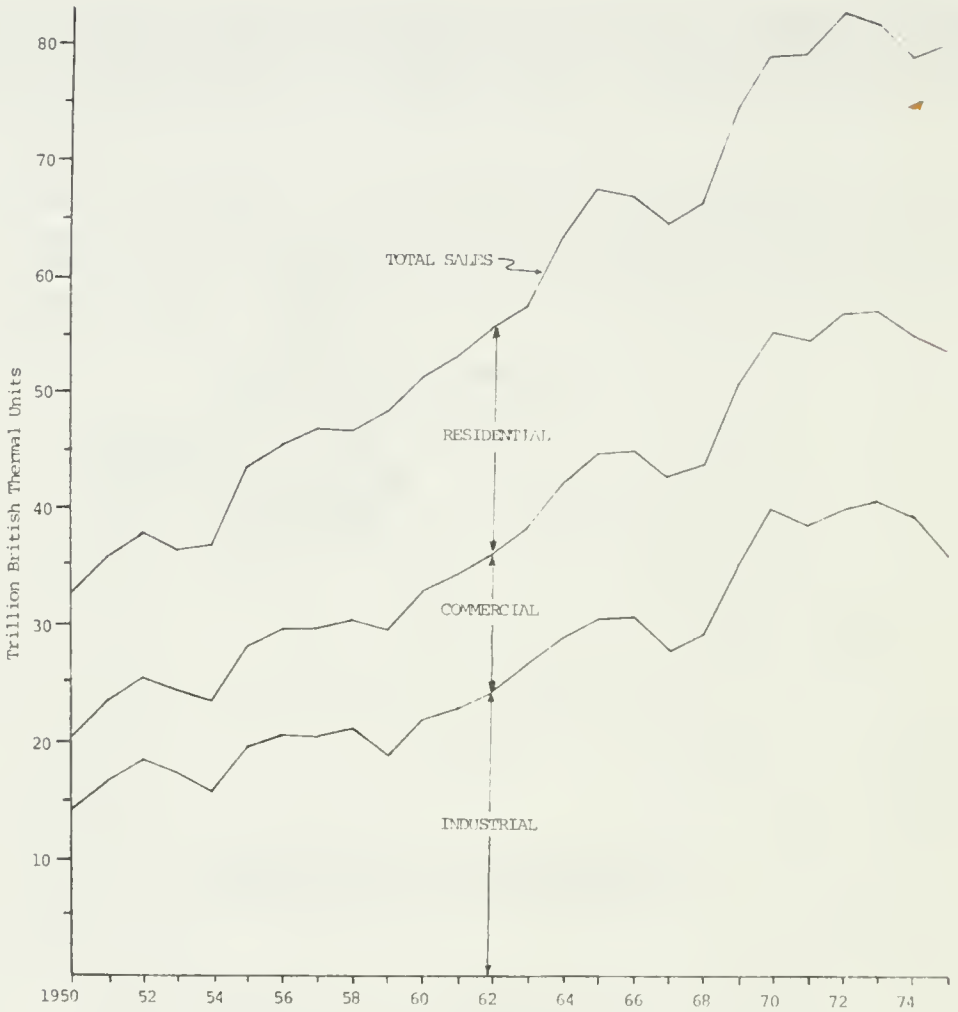

Figure 1.12: Sales of Natural Gas in Montana, By Consuming Sector
(In Trillion British Thermal Units)

Prices to utilities for natural gas have increased dramatically in the past two years, particularly within the Montana Power Company system. This is primarily due to increases in the import price of Canadian gas. Since July 1, 1974, prices for Canadian natural gas have increased from 33 cents per thousand cubic feet (mcf) to $1.60 per mcf. Recent announcements indicate that these prices will increase to $1.80 per mcf in September 1976 and then to $1.94 per mcf in January 1977. For comparison, recent contracts for purchases of Montana gas production have been made for about $0.85 per mcf. The price established by the Federal Power Commission for interstate sales of recently developed natural gas has been raised from $0.52 per mcf to $1.42 per mcf (this increase has been temporarily set aside by court action). The expected conversion from natural

gas to alternative fuels by several Montana industries will have a noticeable effect on Montana consumption. Conversion to coal by Great Western Sugar and Ideal Cement will save about 0.9 bcf and 2 bcf per year, respectively, and the use of electricity in the Anaconda copper smelter will also save over 2.5 bcf per year. In spite of this, Montana-Dakota Utilities has requested the authority from the Federal Power Commission to curtail gas deliveries to industries during the 1976-77 heating season by as much as 22 percent, if necessary.

Petroleum

Montana petroleum reserves were first tapped commercially in 1916. Since that time, our knowledge of the extent of this resource has expanded, and production of crude oil has expanded with it. (In the last five years, Montana crude oil production has been relatively stable at about 34 million barrels per year.) Montana proven reserves of crude petroleum as of December 31, 1975, are variously estimated at from 164 million barrels by the American Petroleum Institute (API) to 255 million barrels by the Montana Department of Natural Resources and Conservation (DNR). At 1975 production levels, this would leave the state with from five to seven years of production before presently known recoverable reserves are depleted. Due to transportation limitations, only about 36 percent of these known reserves, or 91.2 million barrels (DNR), are available to the major Montana refineries. If all of this fraction of total reserves were immediately available and used by Montana refineries, it would represent less than two years supply at current rates of crude oil throughput. Once again, as with natural gas, federal actions to decontrol allowable prices to be paid for crude oil could provide incentives for additional exploration and production in Montana.

As can be seen in Figure 1.13, Montana both imports and exports large volumes of crude oil. In 1975 the source of total crude refined in Montana was 17 percent from Montana production, 40 percent from Wyoming and 43 percent from Canada. The Canadian feedstock is an uncertain source for the future, since the National Energy Board of Canada has announced plans to completely curtail exports of crude oil to United States refineries, similar to actions already initiated for natural gas exports. Plans are currently being formulated to deliver Alaskan crude oil to several northern states, including Montana, to replace the Canadian feedstock. These proposals include: the construction of a Northern Tier pipeline from the Puget Sound area, through Montana, to a

Figure 1.13: Supply of Crude Oil in Montana in 197[illegible]

Minnesota link with other pipelines; and the construction of a transprovincial pipeline across British Columbia, connecting with existing pipeline systems in Alberta. However, it will probably be several years before any crude oil could be delivered by either route. In the interim, if sufficient crude oil is not available, some Montana refineries may be forced to close, resulting in significant adverse economic impacts to the state. In addition, if the state's refineries cannot continue to operate, it may be necessary to import finished petroleum products, probably at a higher cost to Montana consumers.

Production of crude oil from Northern, Central and Southcentral Montana, the areas that supply Montana refineries, has been relatively stable over the past three decades, accounting for only about 30 percent of total Montana production in recent years. Major discoveries of crude reserves in the Williston Basin in 1951 and the Powder River Basin in 1966 imposed substantial changes on the state's crude production picture, as is shown in Figure 1.14. However, crude produced from these two areas is almost totally dedicated to export, since no pipelines exist to transport it to the major refineries in the Billings area.

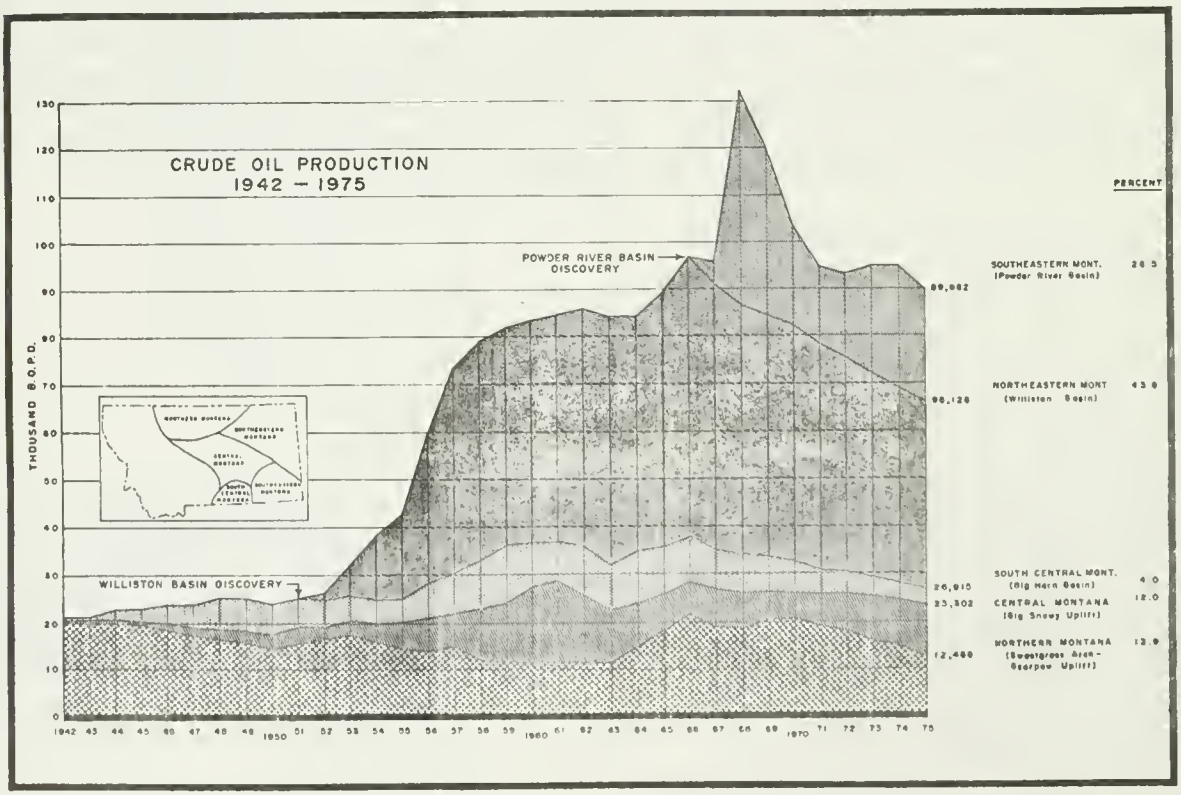

Figure 1.14: Crude Oil Production, 1942-1974, Mt. Oil and Gas Conservation Division, Department of Natural Resources and Conservation (Thousand Barrels of Oil Per Day)

The three Billings area refineries have accounted for nearly 90 percent of total Montana refinery output in recent years. All these refineries are heavily dependent on imported Canadian crude oil. The Continental Oil refinery in Billings, in addition to receiving Canadian crude oil, relys for almost one-third of its total inputs on imported Canadian natural gas condensates. (Natural gas condensates are liquid hydrocarbons which are produced in association with natural gas, the liquid fraction being separated by various condensation techniques. They require minimal additional refining, and are close to a "natural gasoline".) Imports of Canadian feedstocks to Montana began in 1962 with the completion of the Glacier pipeline system. Reliance on Canadian inputs has steadily increased, as the refineries expanded and adjusted to the lighter and sweeter (lower sulfur content) Canadian crude oil and condensates. Annual importation of Canadian crude oil and condensates reached a peak of 24.3 million barrels in 1973 and declined slightly to 20.7 million barrels in 1975. Figure 1.15 shows the level of total crude oil inputs to Montana refineries and the portions that came from Montana, Wyoming and Canada.

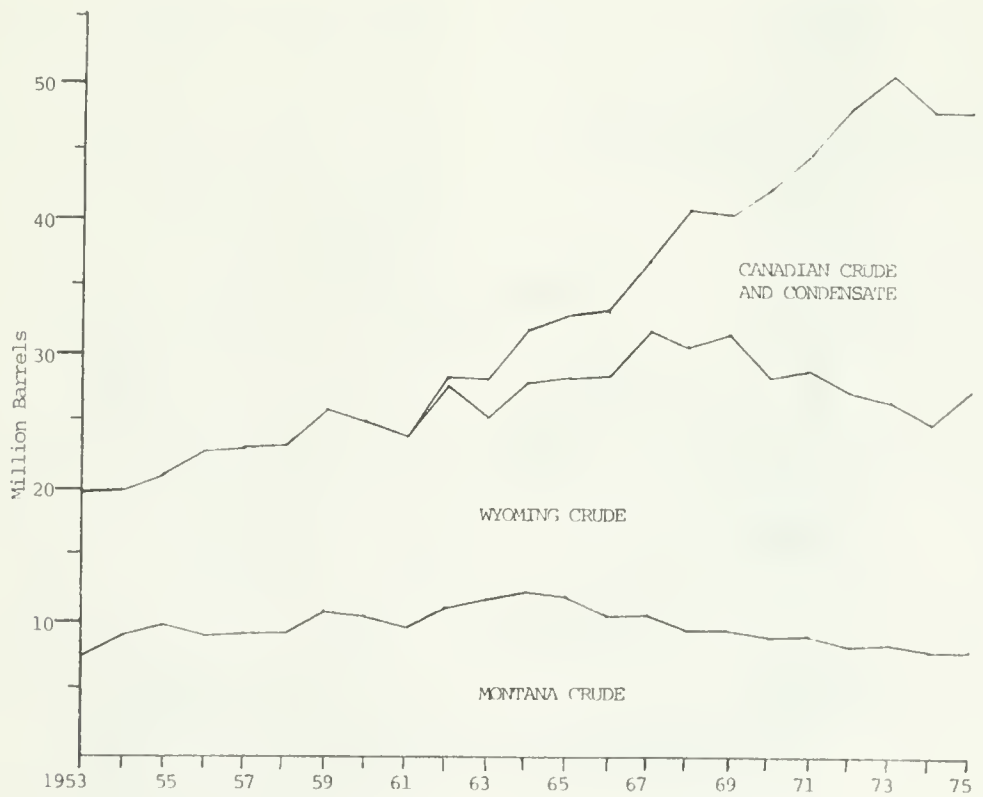

Figure 1.15: Petroleum Refined in Montana, By Source of Crude
(In Million Barrels)

In addition to the three Billings area refineries, three smaller refineries operate in Northcentral Montana and one small refinery is located near Wolf Point. These four plants supply local markets, whereas the Billings refineries produce sufficient quantities of petroleum products to supply most of Montana's needs and also to export 50 percent or more of their outputs to Washington, Idaho, North Dakota and Wyoming.

Over the past few decades, consumption of petroleum products has increased steadily, with over 60 percent of this energy now used for transportation. Use of motor gasoline constitutes the largest share of the demand for petroleum in Montana, accounting for over 65 percent of transportation energy use, and over 40 percent of total demand for petroleum products in the state in 1974. The use of motor gasoline has grown, fairly steadily, at an average annual growth rate of close to 3 percent since 1950. Consumption of distillate fuel oils and residual fuel oils has varied widely over the past 25 years, with the use of distillates generally increasing while the use of residuals has been generally decreasing. Figure 1.16 illustrates the consumption of the major petroleum products in Montana.

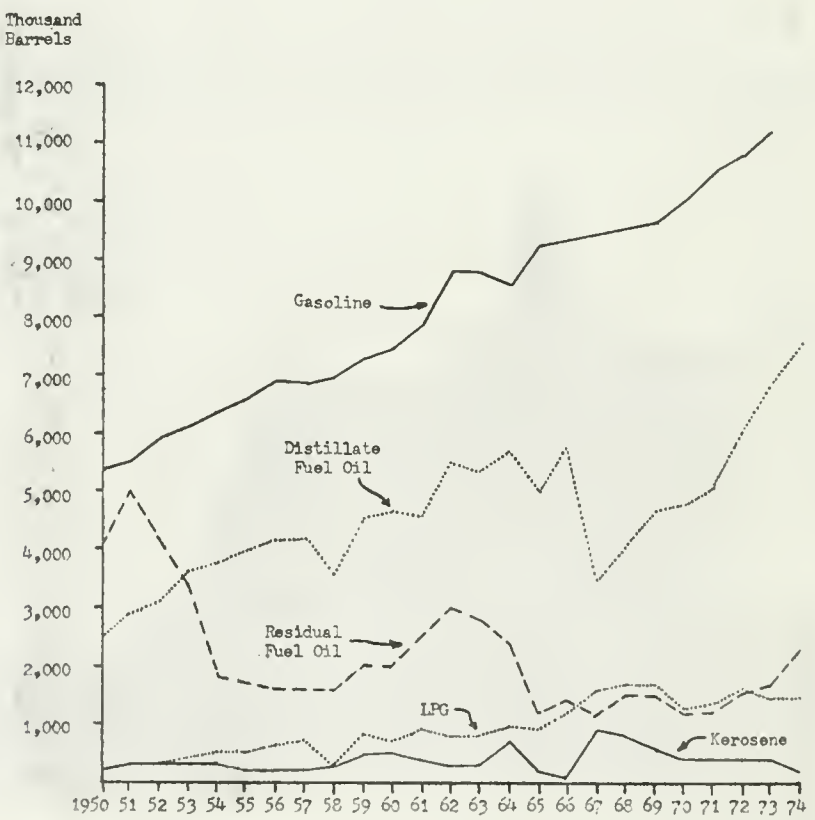

Figure 1.16: Consumption of Petroleum Products in Montana

Source: U.S. Bureau of Mines

Coal

Montana is underlain by massive amounts of easily strippable, low sulfur coal. The Montana Bureau of Mines and Geology estimates the existence of 50 billion-plus tons of strippable lignite and subbituminous coal under overburden of 300 feet or less, in only a part of Eastern Montana. The total demonstrated reserve base of Montana coal is estimated to be 108 billion tons, accounting for over 25 percent of known coal reserves in the United States. Even more important, strippable, low sulfur coal reserves in Montana, those containing less than 1 percent sulfur by weight and lying under generally less than 120 feet of overburden, are estimated by the United States Bureau of Mines to amount to over 38 billion tons, or more than half of the nation's strippable, low sulfur reserves of coal. These reserves would last thousands of years at current production rates. Figures 1.18 and 1.19 show the state's coal reserves in relation to the rest of the nation. Notice that Montana's low sulfur reserves are estimated to be greater than those of all other states combined.

Clearly, coal is beginning and will continue to have a dominant role in the energy picture in Montana. Much of the nation will look to Montana's coal as a major energy source as other fossil fuels become scarce, and as environmental constraints encourage the use of low sulfur coal, which is produced more economically from western strip mines than from the deep reserves of eastern states. The recent rapid growth in coal production from Montana's mines has been noted above. (See Figures 1.2 and 1.5.) Virtually all of the state's production is exported (94 percent in 1975), principally for electric generation in the Midwest. Even so, a very small amount of coal, about 50,000 tons per year, continues to be imported to Montana from Wyoming, Colorado, and Utah for use by a few industries. Most of the coal consumed in the state is for electric power generation in Eastern Montana. Consumption of coal in Montana is expected to increase substantially, as new coal-fired generating plants come on line, and as several Montana industries complete their efforts to convert from the use of natural gas to coal.

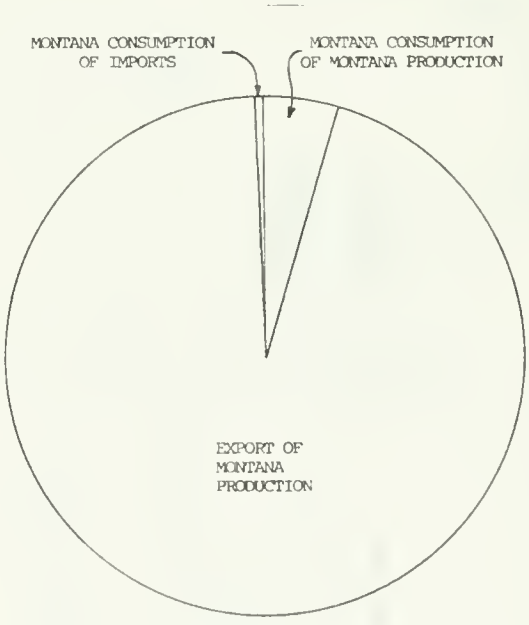

Figure 1.17: Supply of Coal in Montana in 1975

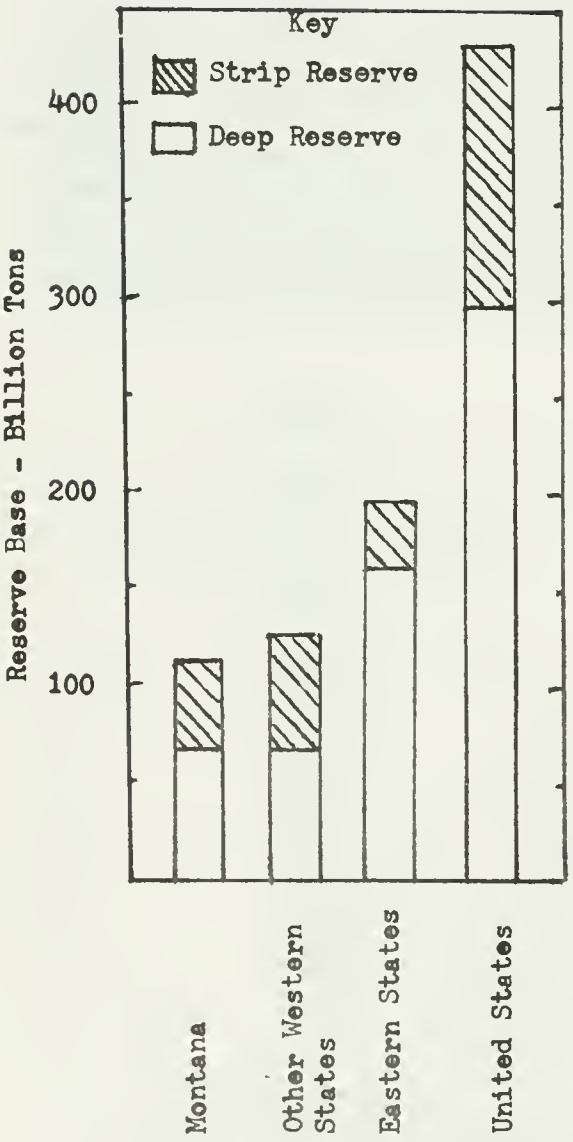

Figure 1.18

Reserve base of bituminous coal in the United States. (5)

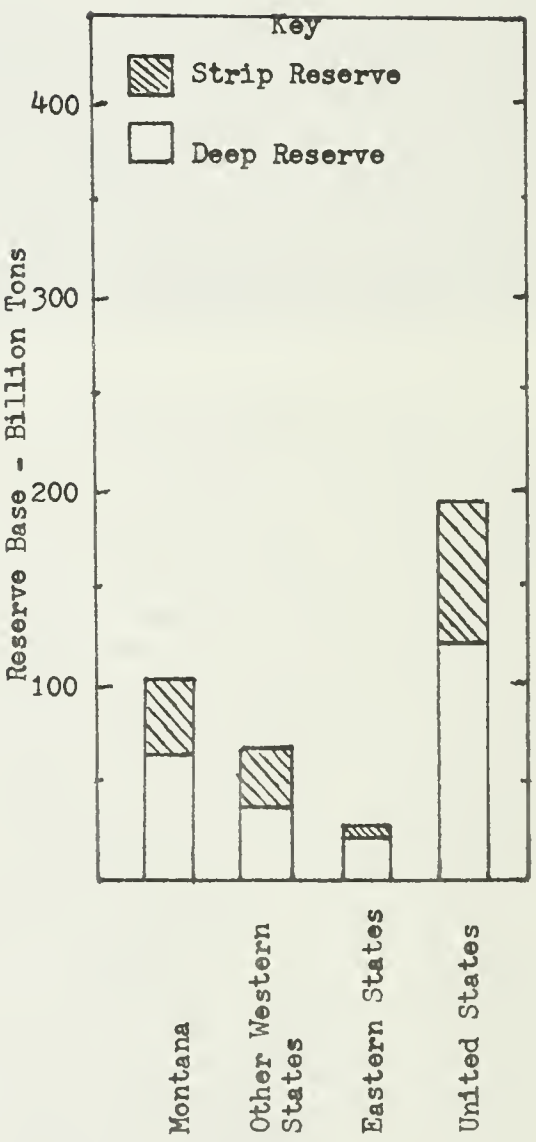

Figure 1.19

Reserve base of low-sulfur bituminous coal in the United States. (6)

Electricity

Development of Montana's powerful rivers has given the state a substantial hydroelectric capability. Total generating capacity in Montana is now 2909 megawatts (MW), of which 1879 MW, or 65 percent, are hydroelectric (including Libby Units 1-4), and 1030 MW are fossil fuel fired (including Colstrip Units 1 and 2). Significant additions to this generating capacity are planned or proposed. These include Libby Units 5 through 8 and the Libby reregulating dam, which together will add 466 MW of hydroelectric power, and Colstrip Units 3 and 4, which will add 1400 MW of coal-fired generating capacity (about 30 percent of Colstrip Units 3 and 4 will be available to Montana utilities). This additional power would appear to assure that the state's intermediate-term needs will be satisfied.

With the extensive private and public hydroelectric network, Montana has long produced more electricity on an annual basis than has been consumed in the state. Due to varying peak demands within the region, however, significant interchanges of electric power with other states do occur. Figure 1.20 charts our historic annual generation and sales of electricity from 1950 through 1974. Figure 1.21 shows the source of generation of our electricity. It has been dominated by hydroelectric generation. Only recently with the development at Colstrip has coal-fired generation begun to play a major role in our power production.

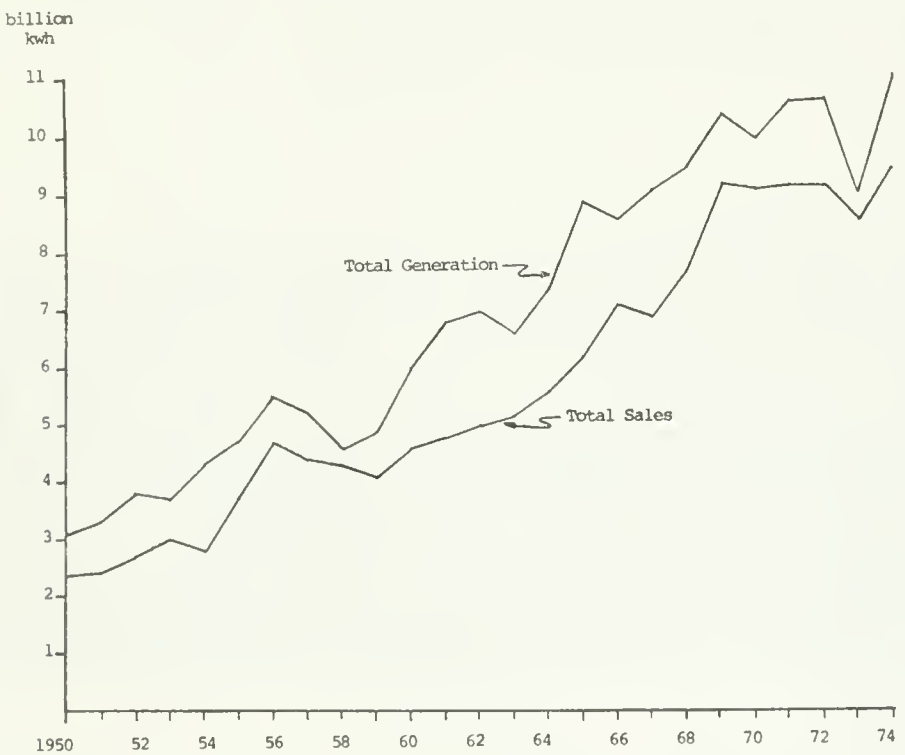

Figure 1.20: Annual Generation and Sales of Electricity in Montana, 1950-1974
(In Billion Kilowatt-Hours)

Figure 1.21: Annual Generation of Electricity in Montana, 1950-1974
(In Billion Kilowatt-hours)

Annual consumption of electricity in Montana is shown in Figure 1.22, with a breakdown by consuming sector. All sectors show a general increase, with industry being both the largest and the most variable user. In 1975, residential and commercial use accounted for almost 40 percent of the total, with industrial consumption reaching nearly 60 percent. Well over half of the industrial use is in the primary metals industry which includes an aluminum plant at Columbia Falls and a copper smelter at Anaconda. The copper smelter is well underway in a project to replace their natural gas-fired furnaces with a new electric furnace, which will substantially increase its use of electricity. Prices for electricity have been relatively stable in Montana, and well below the national average, principally due to the state's abundant hydroelectric power. Recently, though, deflated average annual prices for electricity in the nation have begun to rise for the first time since 1946. This trend also is apparent in Montana, and can be expected to continue, as the new coal-fired generating plants increase their share of total electricity produced.

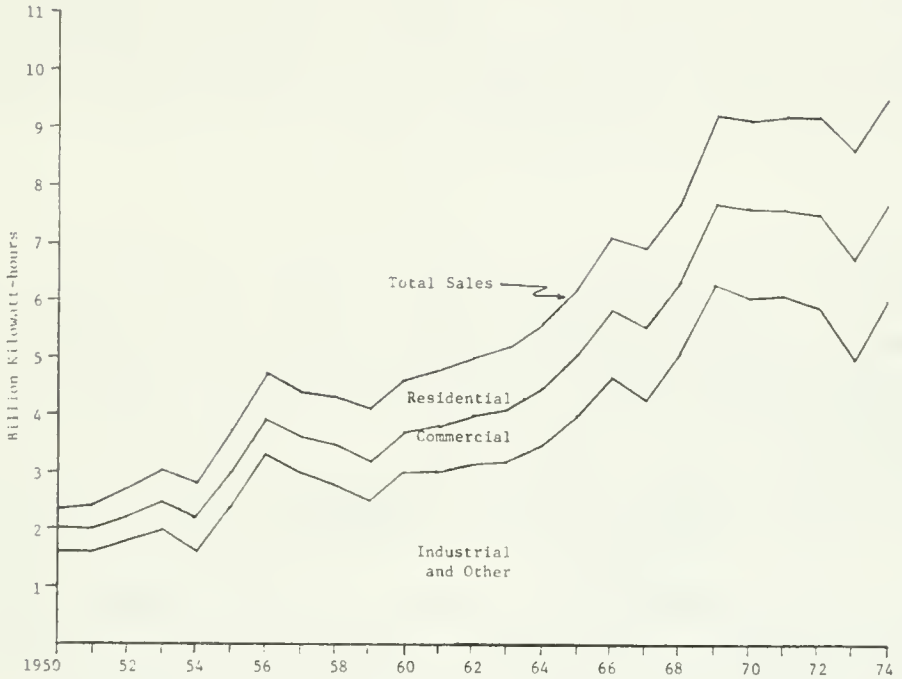

Figure 1.22: Annual Sales of Electricity in Montana, 1950-1974
(In Billion Kilowatt-hours)

Other Energy Sources

There have been no discoveries of commercial quality uranium ore in Montana. Adoption of solution mining techniques for development of uranium ores may change the definition of "commercial quality" ore. Should this occur, uranium deposits in Montana could be considered suitable for development. According to the Montana Bureau of Mines and Geology, likely areas for discovery of exploitable uranium ore in Montana lie within the Big Hole drainage, the Ruby Valley and the Carbon County quadrant in Eastern Montana. Some quantities of pitchblende have been noted in Northwestern Montana near the Idaho border.

Unfortunately, no complete data exist to document the direct use of renewable energy sources in Montana, most notably wood, wind and solar power. Certainly, not too many years past, wood provided a significant share of energy consumed in the state. Recent increases in the prices of nonrenewable energy sources appear to have brought many people back to this abundant, low-cost fuel. Also, within the wood products industries in Montana, wood residues supply an increasing share of energy consumption. Several experimental projects designed to make direct utilization of wind and solar power are underway in the state, which may, in the near future, indicate that these renewable energy sources can provide viable alternatives for Montanans.

Energy Data

The remainder of this publication consists primarily of tabular displays of energy statistics, drawn from several sources. The data presented are generally for Montana reserves, production, consumption, processing and prices for natural gas, crude oil and petroleum products, coal and electricity. Some comparative data for the nation are also presented, although no thorough attempt was made to completely document the national energy situation. Excellent data summaries for the nation are available, and are noted in the references section. The Appendix provides notes for the data tables, which give details concerning definitions and differences in data elements, to the extent that they are known at this time.

Most of the data are presented in physical units (i.e., cubic feet, tons, barrels, and kilowatt-hours). A conversion to British Thermal Units (BTUs) is the standard means for interfuel comparisons, even though it introduces an additional approximation and does not account for the various efficiencies of fuels for different uses. Table 1.1 presents some standard BTU conversion values.

Footnotes

(1) Economically recoverable reserves were taken as proven reserves of crude oil and natural gas, and for coal as 50 percent of the underground demonstrated reserve base plus 80 percent of the strippable demonstrated reserve base.

(2) Hydropower is shown using a conversion rate of 3,412 BTU/kwh, which is a measure of energy available to the end-user. The fossil fuel equivalent conversion rate for hydropower would be about 10,400 BTU/kwh. Due to the greater efficiency of hydroelectric generation compared to fossil-fuel-fired electric generation, the importance of hydropower appears understated.

(3) Gross energy is defined as the total of inputs of primary fuels (petroleum, natural gas, coal, including imports) or their derivatives, plus the generation of hydro and nuclear power converted to fossil fuel equivalent energy inputs.

(4) In Figure 1.8, only the net import of natural gas to Montana within the Montana-Dakota Utilities system is shown.

(5) The demonstrated reserve base of coal includes beds of bituminous coal and anthracite 28 inches or more think and beds of subbituminous coal 60 inches or more thick that occur at depths to 1000 feet. In includes beds of lignite 60 inches or more thick that can be surface mined. Strippable beds of subbituminous coal and lignite are generally those that occur at depths no greater than 120 feet.

(6) The demonstrated reserve base of coal is defined as in (5). Low sulfur coals are those that contain less than 1.0 percent sulfur by weight.

Table 1.1

Energy Conversion Factors

Type of Fuel	Quantity	Approximate BTU Content
Coal:		
Anthracite -- U.S. Average	Short Ton	25,400,000
Bituminous -- U.S. Average	Short Ton	23,650,000
Montana Subbituminous	Short Ton	17,500,000
Montana Lignite	Short Ton	13,000,000
Natural Gas (Dry)	Cubic Foot	1,000
Crude Petroleum	Barrel	5,610,000
Petroleum Products:		
Motor Gasoline	Barrel	5,250,000
Distillate Fuel Oil	Barrel	5,830,000
Residual Fuel Oil	Barrel	6,290,000
Kerosene	Barrel	5,670,000
LP Gases (Propane-Butane Mix)	Barrel	4,011,000
Lubricants	Barrel	6,070,000
Average All Products	Barrel	5,520,000
Electricity	Kilowatt-Hour	3,412

(Note: Short ton equals 2,000 pounds. Barrel equals 42 gallons.)

II. FOSSIL FUEL RESERVE ESTIMATES

Table 2.1

Changes in Proved Reaerves of Natural Gas in the United States During 1975 (million cubic feet)

	Total	Non-Associated	Associated/Dissolved
Proved Reserves as of 12/31/74 a/	237,132,497	162,192,222	71,002,190
Underground Storage as of 12/31/74	3,938,085	--	--
Revisions	383,449	1,051,389	-667,940
Extensions	6,027,433	5,565,189	462,244
New Field Discoveries	2,423,382	2,230,216	193,166
New Reservoir Discoveries	1,649,424	1,524,530	124,894
Net Changes in Underground Storage	302,561	--	--
Production b/	19,718,570	15,777,995	3,940,575
Proved Reserves as of 12/31/75 a/	228,200,176	156,785,551	67,173,979
Underground Storage as of 12/31/75	4,240,646	--	--
Net Changes in Proved Reserves in 1975	-8,932,321	-5,406,671	-3,828,229

a/ Underground storage included in Total Reserves.
b/ Preliminary estimate.

Source: American Gas Association.

Table 2.2

Natural Gas Proved Reserves in the United States 1950-1975 (million cubic feet)

	Year-End Reserves			
Year	Non-Associated	Associated/Dissolved	Underground Storage	Total Gas
1950	129,919,009	54,325,898	339,838	184,584,745
1951	133,044,892	59,242,150	471,868	192,758,910
1952	136,892,642	61,069,290	669,634	198,631,566
1953	146,052,855	63,062,645	1,183,263	210,298,763
1954	145,282,729	64,004,531	1,273,671	210,560,931
1955	151,229,351	69,892,358	1,360,835	222,482,544
1956	159,163,774	75,825,365	1,494,076	236,483,215
1957	167,558,391	75,998,909	1,672,837	245,230,137
1958	176,894,570	74,136,803	1,730,419	252,761,792
1959	183,170,257	76,109,302	1,890,872	261,170,431
1960	185,291,523	74,862,658	2,172,145	262,326,326
1961	190,669,393	73,272,560	2,331,689	266,273,642
1962	198,687,335	71,100,603	2,490,920	272,278,858
1963	201,219,649	72,186,931	2,744,653	276,151,233
1964	207,122,360	71,189,331	2,939,763	281,251,454
1965	213,315,274	70,063,403	3,090,246	286,468,923
1966	217,426,169	68,681,867	3,224,769	289,332,805
1967	221,751,275	67,780,256	3,376,172	292,907,703
1968	220,990,299	62,864,813	3,494,740	287,349,852
1969	211,873,282	59,633,644	3,601,909	275,108,835
1970	204,098,552	82,643,929	4,003,927	290,746,408
1971	195,953,617	78,537,773	4,314,228	278,805,618
1972	186,072,643	75,541,412	4,470,791	266,084,846
1973	172,245,938	73,587,760	4,116,509	249,950,207
1974	162,192,222	71,002,190	3,938,085	237,132,497
1975	156,785,551	67,173,979	4,240,646	228,200,176

Source: American Gas Association.

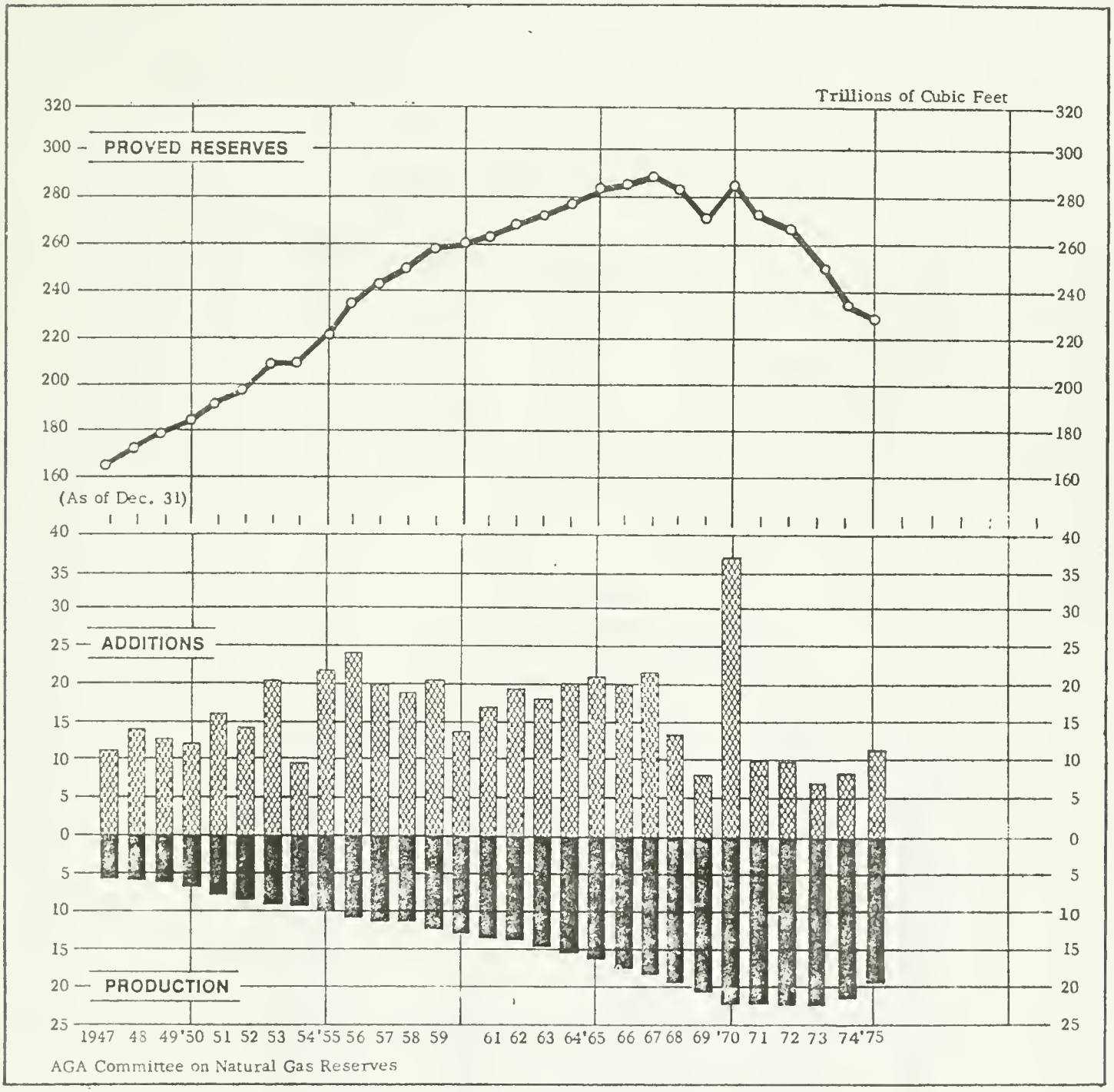

Figure 2.1: Proved Reserves of Natural Gas in the United States, 1947-1975

Table 2.3

Changes in Proved Reserves of Natural Gas in Montana
During 1975 (million cubic feet)

	Total	Non-Associated	Associated/Dissolved
Proved Reserves as of 12/31/74 a/	901,260	676,749	81,272
Underground Storage as of 12/31/74	143,239	--	--
Revisions	13,701	11,503	2,198
Extensions	13,617	13,260	357
New Field Discoveries	27,347	27,286	61
New Reservoir Discoveries	0	0	0
Net Change in Underground Storage	26,485	--	--
Production b/	52,424	42,448	9,976
Proved Reserves as of 12/31/75	929,986	686,350	73,912
Underground Storage as of 12/31/75	169,724	--	--
Net Changes in Proved Reserves in 1975	28,726	9,601	-7,360

a/ Underground storage included in Total Reserves.
b/ Preliminary estimate.

Source: American Gas Association.

Table 2.4

Natural Gas Proved Reserves in Montana
1950-1975 (million cubic feet)

	Year-End Reserves			
Year	Non-Associated	Associated/Dissolved	Underground Storage	Total Gas
1950	718,722	69,839	4,470	793,031
1951	696,554	119,533	7,522	823,609
1952	693,916	119,631	9,562	823,109
1953	612,965	117,937	28,949	759,851
1954	573,496	116,183	30,122	719,801
1955	560,565	125,067	30,178	715,810
1956	546,049	115,906	30,614	692,569
1957	512,583	119,311	34,914	666,808
1958	508,851	132,295	37,163	678,309
1959	492,162	128,880	40,835	661,877
1960	462,532	105,362	54,883	622,777
1961	435,178	104,319	53,601	593,098
1962	419,128	98,958	82,085	600,171
1963	399,266	103,558	95,307	598,131
1964	384,278	99,287	106,704	590,269
1965	373,440	103,672	118,740	595,852
1966	383,346	102,239	134,765	620,350
1967	550,681	138,454	148,583	837,718
1968	579,572	174,266	157,695	911,533
1969	799,770	147,927	162,511	1,110,208
1970	793,283	141,854	164,786	1,099,923
1971	715,195	127,032	182,334	1,024,561
1972	790,660	92,628	180,748	1,064,036
1973	821,513	85,625	185,311	1,092,449
1974	676,749	81,272	143,239	901,260
1975	686,350	73,912	169,724	929,986

Source: American Gas Association.

Figure 2.2: Estimates of Proven Reserves and Underground Storage of Natural Gas in Montana, 1950-1975 (In Billion Cubic Feet)

Source: American Gas Association

Table 2.5

Changes in Proved Reserves of Natural Gas Liquids in Montana During 1975 (thousand barrels)

	Total	Non-Associated	Associated/Dissolved
Proved Reserves as of 12/31/74	2,946	459	2,487
Revisions	1,014	1,000	14
Extensions	0	0	0
New Field Discoveries	0	0	0
New Reservoir Discoveries	0	0	0
Production a/	642	249	393
Proved Reserves as of 12/31/75	3,318	1,210	2,108
Net Changes in Proved Reserves in 1975	372	751	-379

a/ Preliminary estimate.

Source: American Gas Association.

Table 2.6

Proved Reserves of Natural Gas Liquids in Montana, 1950-1975 (thousand barrels)

	Year-End Reserves		
Year	Non-Associated	Associated/Dissolved	Total NGL
1950	3,547	0	3,547
1951	3,341	0	3,341
1952	3,129	0	3,129
1953	2,908	0	2,908
1954	33	7,146	7,179
1955	0	6,857	6,857
1956	0	8,145	8,145
1957	0	7,805	7,805
1958	40	7,457	7,497
1959	1,861	11,650	13,511
1960	2,482	9,206	11,688
1961	2,239	8,873	11,112
1962	2,029	8,459	10,488
1963	1,873	8,105	9,978
1964	2,304	10,668	12,972
1965	2,498	7,490	9,988
1966	2,322	8,316	10,638
1967	2,139	7,617	9,756
1968	1,950	7,833	9,783
1969	1,691	8,190	9,881
1970	1,401	7,218	8,619
1971	1,142	7,939	9,081
1972	925	3,488	4,413
1973	694	2,931	3,625
1974	459	2,487	2,946
1975	1,210	2,108	3,318

Source: American Gas Association.

Figure 2.3: Estimates of Proven Reserves of Natural Gas Liquids in Montana, 1950-1975 (In Million Barrels)

Source: American Gas Association

Table 2.7

Changes in Proved Reserves of Natural Gas Liquids in the United States During 1975 (thousand barrels)

	Total	Non-Associated	Associated/Dissolved
Proved Reserves as of 12/31/74	6,350,449	4,109,128	2,241,321
Revisions	345,496	123,107	222,389
Extensions	116,810	87,631	29,179
New Field Discoveries	128,036	122,364	5,672
New Reservoir Discoveries	28,162	25,621	2,541
Production a/	701,123	427,723	273,400
Proved Reserves as of 12/31/75	6,267,830	4,040,128	2,227,702
Net Change in Proved Reserves in 1975	-82,619	-69,000	-13,619

a/ Preliminary estimate.

Source: American Gas Association.

Table 2.8

Proved Reserves of Natural Gas Liquids in the United States, 1950-1975 (thousand barrels)

	Year-End Reserves		
Year	Non-Associated	Associated/Dissolved	Total NGL
1950	2,372,189	1,895,474	4,267,663
1951	2,404,128	2,320,474	4,724,602
1952	2,411,496	2,585,155	4,996,651
1953	2,729,919	2,708,003	5,437,922
1954	2,648,599	2,595,858	5,244,457
1955	2,619,926	2,818,639	5,438,565
1956	2,809,846	3,092,486	5,902,332
1957	2,706,246	2,981,114	5,687,360
1958	3,230,975	2,973,043	6,204,018
1959	3,417,915	3,104,393	6,522,308
1960	3,686,986	3,129,073	6,816,059
1961	3,852,152	3,196,944	7,049,096
1962	4,237,659	3,073,858	7,311,517
1963	4,571,636	3,102,342	7,673,978
1964	4,791,833	2,954,799	7,746,632
1965	5,040,024	2,983,510	8,023,534
1966	5,229,261	3,099,705	8,328,966
1967	5,575,956	3,038,275	8,614,231
1968	5,693,001	2,905,107	8,598,108
1969	5,416,898	2,726,276	8,143,174
1970	5,110,939	2,592,002	7,702,941
1971	4,867,070	2,437,157	7,304,227
1972	4,572,721	2,213,838	6,786,559
1973	4,124,031	2,330,676	6,454,707
1974	4,109,128	2,241,321	6,350,449
1975	4,040,128	2,227,702	6,267,830

Source: American Gas Association.

Table 2.9

Changes in Proved Reserves of Crude Oil During 1975
(thousand barrels)

	United States	Montana
Proved Reserves as of 12/31/74	34,249,956	207,389
Revisions: Plus	1,411,445	7,733
Minus	734,174	22,917
Extensions	340,128	3,430
New Field Discoveries	173,177	600
New Reservoir Discoveries	127,887	0
Production a/	2,886,292	32,267
Proved Reserves as of 12/31/75	32,682,127	163,968
Net Changes in Proved Reserves in 1975	-1,567,829	-43,421
Indicated Additional Reserves	5,022,388	58,057

a/ Preliminary estimate.

Source American Petroleum Institute.

Table 2.10

Crude Oil Proved Reserves in the United States and Montana
1950-1975 (thousand barrels)

	Year-End Proved Reserves	
Year	United States	Montana
1950	25,268,398	111,272
1951	27,468,031	108,418
1952	27,960,554	156,181
1953	28,944,828	208,985
1954	29,560,746	272,394
1955	30,012,170	298,948
1956	30,434,649	331,414
1957	30,300,405	319,991
1958	30,535,917	337,799
1959	31,719,347	309,268
1960	31,613,211	266,687
1961	31,758,505	250,909
1962	31,389,223	248,860
1963	30,969,990	271,253
1964	30,990,510	251,620
1965	31,352,391	274,145
1966	31,452,127	281,608
1967	31,376,670	307,972
1968	30,707,117	345,117
1969	29,631,862	275,765
1970	39,001,335	241,529
1971	38,062,957	228,185
1972	36,339,408	241,248
1973	35,299,839	219,343
1974	34,249,956	207,389
1975	32,682,127	163,968

Source: American Petroleum Institute.

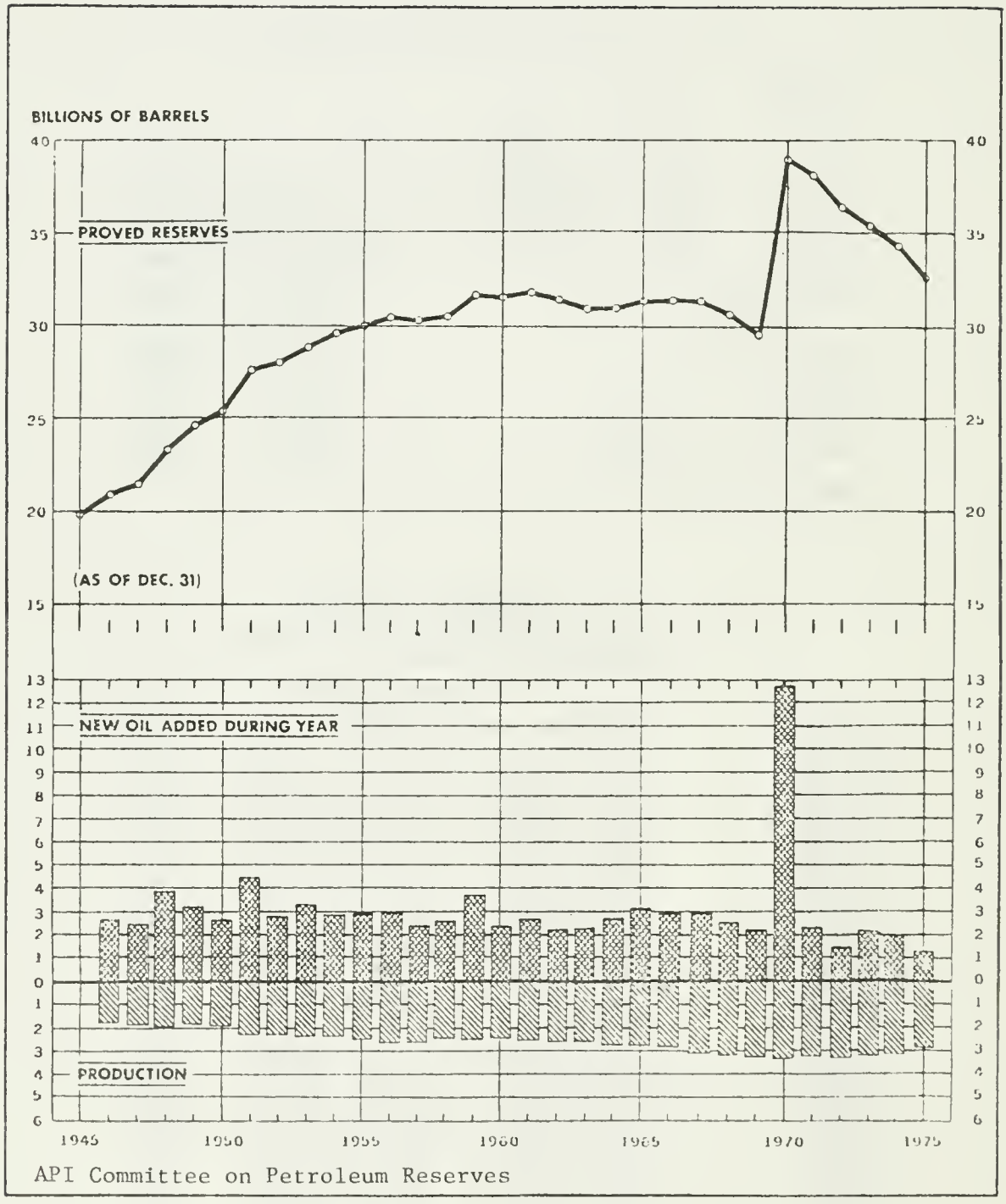

Figure 2.4: Proved Reserves of Crude Oil in the United States

Figure 2.5: Estimates of Proven Reserves of Crude Oil in Montana, 1950-1975 (In Million Barrels)

Source: American Petroleum Institute

Table 2.11
Estimate of Montana Crude Oil
Proved Reserves, by Region

Region	Proved Reserves (million barrels)	Percent of Total
Northeastern Montana	125.0	49%
Southeastern Montana	38.8	15%
Central Montana	32.5	13%
South Central Montana	10.2	4%
Northern Montana	48.5	19%
State Total	255.0	100%

Source: Montana Department of Natural Resources and Conservation, Oil and Gas Conservation Division.

Table 2.12

Demonstrated Reserve Base of Coals in the
United States by Mining Method and Sulfur Content
(million tons)

Region	Mining Method	Sulfur Content by Weight in Percent						
		≤ 1.0	% of U.S. low sulfur reserves	1.1-3.0	>3.0	Unknown	Total	% of U.S. reserves
Montana	Deep	63,464	53%	1,940	456	0	65,834	22%
	Strip	38,183	52%	2,175	46	2,167	42,562	31%
	Total	101,647	52%	4,115	502	2,167	108,398	25%
Other Western States	Deep	35,994	30%	8,817	7,272	13,216	65,322	22%
	Strip	29,684	41%	24,599	3,470	2,940	60,695	45%
	Total	65,678	34%	33,416	10,742	16,156	126,017	29%
Eastern States	Deep	21,220	18%	48,461	65,992	25,812	161,516	55%
	Strip	5,302	7%	6,822	15,435	4,937	32,511	24%
	Total	26,522	14%	55,283	81,427	30,749	194,027	45%
United States	Deep	120,678	100%	59,218	73,720	39,028	292,672	100%
	Strip	73,169	100%	33,596	18,951	10,044	135,768	100%
	Total	193,847	100%	92,814	92,671	49,072	428,442	100%

Source: U.S. Bureau of Mines

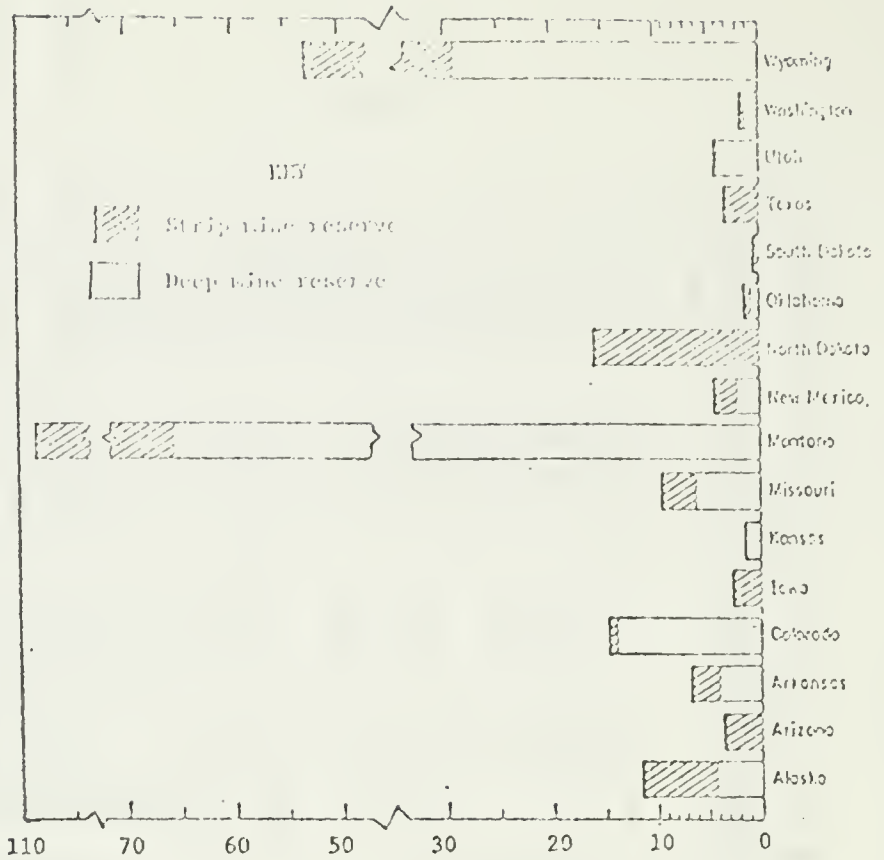

Figure 2.6: Reserve Base of Bituminous Coal in the Western United States (Billion Short Tons)

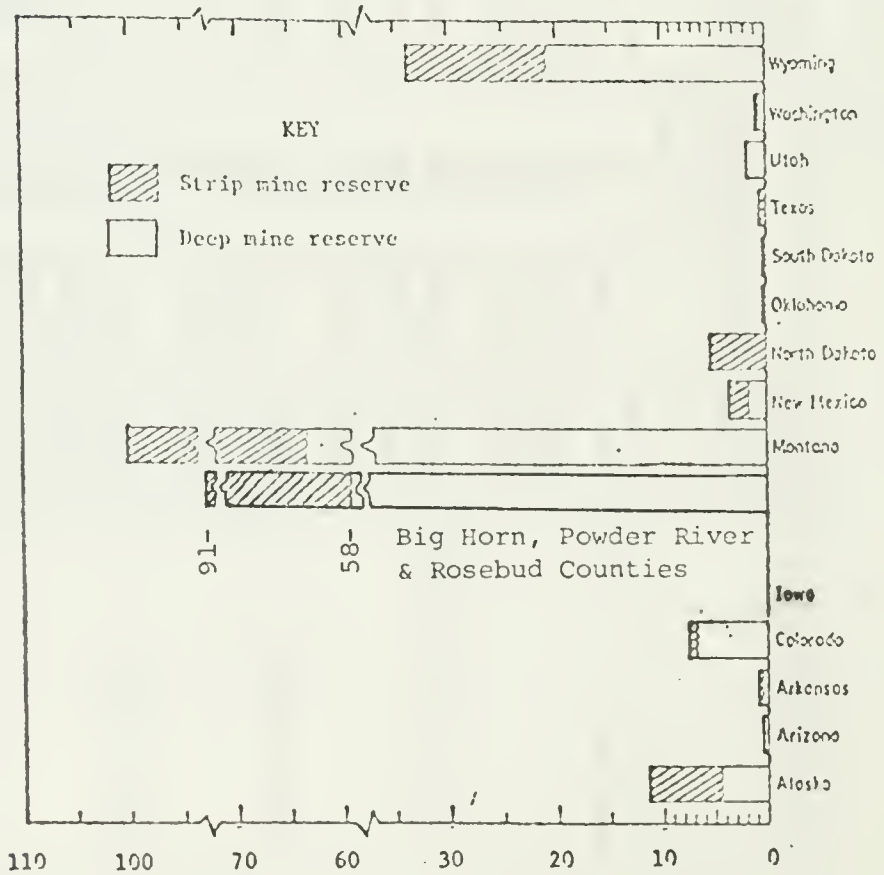

Figure 2.7: Reserve Base of Low-Sulfur Bituminous Coal in the Western United States (less than 1.0 percent sulfur)

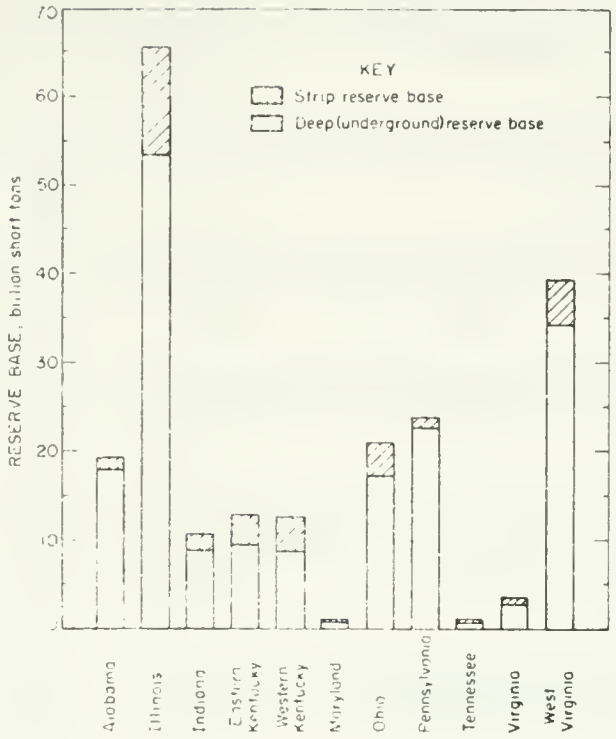

Figure 2.8: Reserve Base of Bituminous Coal in the Eastern United States

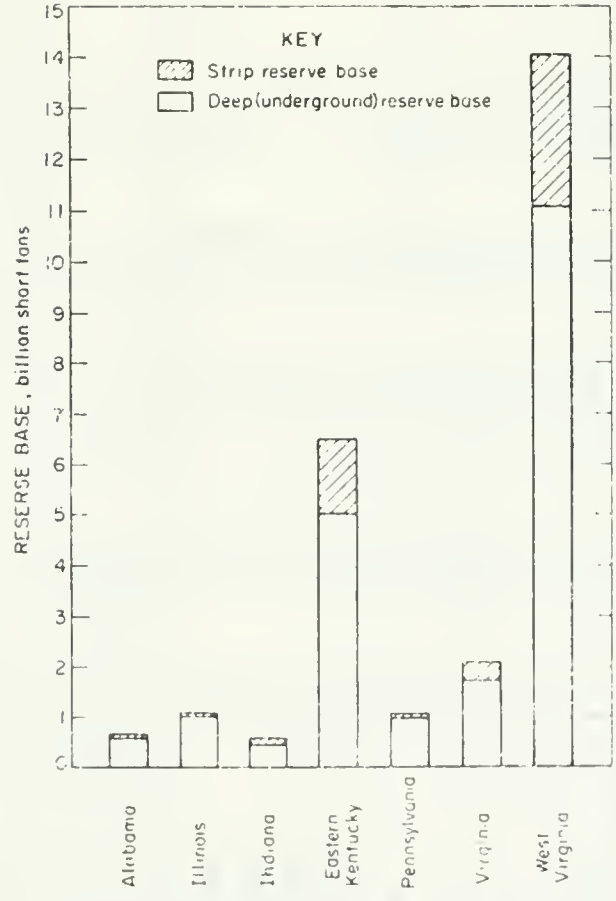

Figure 2.9: Reserve Base of Low-Sulfur Bituminous Coal in the Eastern United States (less than 1.0 percent sulfur)

Table 2.13

Montana Bituminous Coal Reserve Base
by County and Sulfur Range - January 1, 1974
(million short tons)

County	Reserves by Sulfur Range, Percent											
	≤ .4	.5-.6	.7-.8	.9-1.0	1.1-1.4	1.5-1.8	1.9-2.2	2.3-2.6	2.7-3.0	≥3.0	Unknown	Total
Broadwater	.00	.00	.00	.00	.00	.00	.00	.00	.00	5.65	.00	5.65
Carbon	.00	.00	46.31	89.67	318.28	234.49	46.31	.00	.00	.00	.00	735.08
Cascade	.00	.00	.00	.00	.00	4.63	15.44	27.79	43.54	216.79	.00	308.82
Fergus	.00	.00	3.99	4.41	9.66	10.71	11.97	12.81	13.65	143.30	.00	210.13
Glacier	.00	.00	2.08	3.68	10.96	7.22	1.45	.00	.00	.00	.00	25.44
Judith Basin	.00	.00	.00	.00	.00	.00	.00	.00	.00	90.42	.00	90.42
Meagher	.26	.26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.53
Stillwater	.00	1.69	2.99	2.32	.92	.00	.00	.00	.00	.00	.00	7.94
State Total	.26	1.95	55.37	100.08	339.82	257.05	75.17	40.60	57.19	456.16	.00	1384.02

Source: U.S. Bureau of Mines

Table 2.14

Montana Lignite Reserve Base
by County and Sulfur Range - January 1, 1974
(million short tons)

County	Reserves by Sulfur Range, Percent											
	≤ .4	.5-.6	.7-.8	.9-1.0	1.1-1.4	1.5-1.8	1.9-2.2	2.3-2.6	2.7-3.0	≥3.0	Unknown	Total
Custer	222.03	384.47	340.07	163.60	57.26	.00	.00	.00	.00	.00	.00	1168.63
Dawson	30.85	47.38	71.62	100.27	277.67	285.39	184.01	85.94	20.93	.00	.00	1101.90
Fallon	.00	.00	.00	6.00	29.10	54.30	43.65	16.95	.00	.00	.00	150.00
McCone	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	464.40	464.40
Powder River	1252.33	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1252.33
Prairie	23.80	83.60	72.20	17.60	3.00	.00	.00	.00	.00	.00	.00	200.00
Richland	91.07	92.82	91.94	88.44	156.75	122.59	87.57	58.67	37.65	46.41	.00	875.70
Roosevelt	20.68	35.77	56.46	74.99	149.12	77.58	16.37	.00	.00	.00	.00	431.00
Sheridan	38.13	118.94	176.60	93.52	26.78	.00	.00	.00	.00	.00	.00	454.00
Wibaux	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1000.00	1000.00
State Total	1678.89	762.98	808.89	544.42	699.68	539.86	331.60	161.56	58.58	46.41	1464.40	7097.96

Source: U.S. Bureau of Mines

Table 2.15

Montana Subbituminous Coal Reserve Base
by County, Thickness, Type of Mining,
and Sulfur Range - January 1, 1974
(million short tons)

County and Type	Reserves by Sulfur Range, Percent											
	≤ .4	.5-.6	.7-.8	.9-1.0	1.1-1.4	1.5-1.8	1.9-2.2	2.3-2.6	2.7-3.0	≥3.0	Unknown	Total
Big Horn												
Deep	11953.02	10815.95	3993.58	998.39	.00	.00	.00	.00	.00	.00	.00	27733.23
Strip	4577.93	4142.44	1529.51	382.37	.00	.00	.00	.00	.00	.00	.00	10621.65
Total	16530.95	14958.39	5523.09	1380.76	.00	.00	.00	.00	.00	.00	.00	38354.88
Blaine												
Deep	.00	16.01	2.08	.00	.00	.00	.00	.00	.00	.00	.00	18.10
Strip	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Total	.00	16.01	2.08	.00	.00	.00	.00	.00	.00	.00	.00	18.10
Chouteau												
Deep	.00	.06	.20	.23	.08	.00	.00	.00	.00	.00	.00	.58
Strip	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Total	.00	.06	.20	.23	.08	.00	.00	.00	.00	.00	.00	.58
Custer												
Deep	259.38	449.14	397.26	191.12	66.89	.00	.00	.00	.00	.00	.00	1365.17
Strip	218.52	378.38	334.68	161.01	56.35	.00	.00	.00	.00	.00	.00	1150.11
Total	477.90	827.52	731.94	352.13	123.24	.00	.00	.00	.00	.00	.00	2515.28
Garfield												
Deep	.00	115.43	.00	.00	.00	.00	.00	.00	.00	.00	.00	115.43
Strip	.00	21.72	.00	.00	.00	.00	.00	.00	.00	.00	.00	21.72
Total	.00	137.15	.00	.00	.00	.00	.00	.00	.00	.00	.00	137.15
McCone												
Deep	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Strip	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	702.28	702.28
Total	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	702.28	702.28

Table 2.15
(Continued)

County and Type	Reserves by Sulfur Range, Percent											
	≤.4	.5-.6	.7-.8	.9-1.0	1.1-1.4	1.5-1.8	1.9-2.2	2.3-2.6	2.7-3.0	≥3.0	Unknown	Total
Musselshell												
Deep	1218.72	1561.17	577.46	.00	.00	.00	.00	.00	.00	.00	.00	3357.37
Strip	39.93	51.15	18.92	.00	.00	.00	.00	.00	.00	.00	.00	110.00
Total	1258.65	1612.32	596.38	.00	.00	.00	.00	.00	.00	.00	.00	3467.37
Powder River												
Deep	11343.09	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	11343.09
Strip	15217.51	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	15217.51
Total	26560.60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	26560.60
Rosebud												
Deep	2349.92	6670.74	7182.42	2747.89	.00	.00	.00	.00	.00	.00	.00	18950.99
Strip	906.82	2574.22	2771.67	1060.40	.00	.00	.00	.00	.00	.00	.00	7313.13
Total	3256.74	9244.96	9954.09	3808.29	.00	.00	.00	.00	.00	.00	.00	26264.12
Treasure												
Deep	.00	.00	.00	.00	.00	.00	976.09	.00	.00	.00	.00	976.09
Strip	.00	.00	.00	.00	.00	.00	327.57	.00	.00	.00	.00	327.57
Total	.00	.00	.00	.00	.00	.00	1303.66	.00	.00	.00	.00	1303.66
Yellowstone												
Deep	66.69	119.81	151.68	125.12	105.05	19.47	2.36	.00	.00	.00	.00	590.20
Strip	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Total	66.69	119.81	151.68	125.12	105.05	19.47	2.36	.00	.00	.00	.00	590.20
State Total												
Deep	27190.82	19748.31	12304.68	4062.75	172.02	19.47	978.45	.00	.00	.00	.00	64450.25
Strip	20960.71	7167.91	4654.78	1603.78	56.35	.00	327.57	.00	.00	.00	702.28	35463.97
Total	48151.53	26916.22	16959.46	5666.53	228.37	19.47	1306.02	.00	.00	.00	702.28	99914.22

Source: U.S. Bureau of Mines

Table 2.16

Average Analyses of Coal by County

County	Moisture	Ash		Sulfur			BTU			No. of
	A.R.	A.R.	Dry	A.R.	Dry	M&AF	A.R.	Dry	M&AF	Anal
Big Horn	23.9	3.4	4.5	0.3	0.4	0.4	9,500	12,490	13,080	20
Blaine	23.9	8.2	10.8	0.3	0.5	0.5	8,660	11.370	12,750	30
Broadwater	3.1	28.3	29.3	7.5	7.8	11.0	9,590	9,910	14,010	6
Carbon	9.1	9.7	10.7	1.8	2.0	2.2	10,950	12,050	13,490	366
Carter	40.1	10.7	18.0	1.0	1.8	2.1	5,910	9,860	12,030	2
Cascade	5.3	20.0	21.2	3.5	3.7	4.6	10,200	10,770	13,670	64
Chouteau	13.0	14.4	16.6	0.6	0.8	0.9	9,220	10,610	12,730	22
Custer	30.4	7.9	11.4	0.4	0.6	0.6	7,470	10,730	12,110	17
Daniels	36.2	8.9	14.0	0.9	1.5	1.7	6,330	9,920	11,530	3
Dawson	33.4	7.1	10.7	0.7	1.2	1.3	7,120	10,690	11,970	16
Fallon	40.1	10.7	18.0	1.0	1.8	2.1	5,910	9,860	12,030	2
Fergus	15.1	11.3	13.4	3.2	3.8	4.3	9,780	11,520	13,300	30
Flathead	17.7	12.3	15.0	2.3	2.9	3.4	8,950	10,880	12,800	2
Garfield	29.8	12.4	17.8	0.4	0.6	0.7	7,210	10,270	12,490	2
Glacier	9.8	17.9	19.9	1.0	1.2	1.4	9,960	11,050	13,790	4
Granite	19.4	16.9	21.0	1.3	1.7	2.1	8,700	10,790	13,660	1
Hill	7.6	13.6	14.8	0.8	0.9	1.0	10,450	11,310	13,270	5
Judith Basin	9.9	17.4	19.4	4.1	4.6	5.7	9,610	10,660	13,230	5

Table 2.16
(Continued)

County	Moisture	Ash		Sulfur			BTU			No. of
	A.R.	A.R.	Dry	A.R.	Dry	M&AF	A.R.	Dry	M&AF	Anal
McCone	30.1	7.7	11.1	0.5	0.8	0.8	7,600	10,870	12,230	3
Meagher	18.0	20.8	25.4	0.3	0.4	0.5	7,440	9,090	12,180	2
Missoula	24.9	19.7	26.3	0.8	1.1	1.4	6,710	8,930	12,120	2
Musselshell	13.7	8.5	9.9	0.5	0.6	0.6	10,660	12,350	13,710	601
Park	7.2	17.0	18.4	0.5	0.6	0.7	11,130	12,000	14,700	10
Phillips	22.4	23.4	30.2	1.0	1.3	1.8	6,020	7,760	11,110	2
Pondera	6.6	13.9	14.9	3.0	3.3	3.8	10,930	11,700	13,750	1
Powder River	30.8	6.2	9.1	0.3	0.5	0.5	7,730	11,180	12,290	41
Prairie	30.6	6.0	8.7	0.4	0.6	0.6	7,840	11,290	12,370	27
Richland	34.9	6.0	9.3	0.5	0.8	0.8	7,250	11,130	12,270	59
Roosevelt	38.9	6.0	9.9	0.6	1.0	1.1	6,170	10,090	11,200	9
Rosebud	23.3	7.2	9.4	0.6	0.9	0.9	9,080	11,830	13,060	32
Sheridan	38.0	6.6	10.7	0.3	0.6	0.6	6,350	10,250	11,470	10
Stillwater	7.1	13.3	14.4	0.6	0.7	0.8	11,120	11,970	13,990	3
Treasure	19.8	14.4	18.0	1.5	1.9	2.3	8,580	10,700	13,050	1
Valley	39.0	6.6	10.9	0.5	0.9	1.0	6,130	10,050	11,270	17
Wibaux	39.4	8.7	14.4	0.9	1.5	1.7	6,100	10,070	11,760	2
Yellowstone	20.7	7.7	9.8	0.5	0.7	0.7	8,890	11,210	12,420	19
State Average	15.7	9.2	11.0	1.0	1.2	1.3	10,000	11,860	13,330	1438

Source: U.S. Bureau of Mines

III. NATURAL GAS STATISTICS

Table 3.1

Natural Gas Production and Consumption in the United States (million cubic feet)

Year	Gross Withdrawal	Marketed Production	Consumption	Total Gas Delivered	Residential	Commercial	Industrial	Electric-Utilities	Other
1950	8,433,267	6,247,698	5,993,440	4,687,605	1,191,814	385,717	2,484,595	625,479	NA
1951	9,636,372	7,416,568	7,063,712	5,438,281	1,466,658	461,769	2,750,134	759,720	NA
1952	10,216,376	8,350,986	7,571,833	5,890,116	1,613,094	512,848	2,859,035	905,139	NA
1953	10,587,566	8,694,725	7,935,692	6,243,605	1,676,283	527,747	3,010,960	1,028,615	NA
1954	10,924,764	8,694,725	8,356,889	6,678,631	1,883,887	581,757	3,053,864	1,159,123	NA
1955	11,655,688	9,353,905	9,020,729	7,277,395	2,112,334	625,777	3,392,312	1,146,972	NA
1956	12,305,226	10,026,776	9,653,782	7,946,649	2,314,832	712,950	3,686,395	1,232,532	NA
1957	12,836,071	10,621,838	10,223,546	8,454,326	2,486,593	771,672	3,865,301	1,330,760	NA
1958	13,074,724	10,969,913	10,701,788	8,795,950	2,699,404	867,005	3,864,197	1,365,344	NA
1959	14,151,439	11,980,224	11,754,986	9,679,646	2,896,669	969,773	4,195,007	1,618,197	NA
1960	15,005,381	12,701,182	12,441,001	10,325,890	3,086,193	1,014,641	4,509,727	1,715,329	NA
1961	15,375,743	13,181,527	13,010,158	10,763,709	3,230,809	1,070,959	4,646,584	1,815,357	NA
1962	15,951,241	13,800,718	13,814,151	11,451,528	3,459,536	1,200,068	4,837,086	1,954,838	NA
1963	16,880,525	14,666,000	14,560,398	12,068,984	3,569,389	1,260,848	5,107,539	2,131,208	NA
1964	17,344,903	15,377,566	15,367,458	12,865,983	3,746,115	1,359,770	5,450,910	2,309,188	NA
1965	17,963,100	16,039,753	16,033,189	13,622,973	3,902,802	1,443,648	5,958,270	2,318,253	NA
1966	19,033,839	17,206,628	17,191,711	14,883,647	4,138,259	1,622,740	6,513,880	2,608,768	NA
1967	20,251,776	18,171,325	18,172,894	15,671,646	4,313,304	1,716,551	6,898,540	2,743,251	NA
1968	21,325,000	19,322,400	19,459,939	16,803,966	4,450,354	1,800,643	7,134,018	3,143,858	275,093
1969	22,679,195	20,698,240	20,922,800	18,079,630	4,728,281	1,954,523	7,611,752	3,486,391	298,683
1970	23,786,453	21,920,642	22,045,799	19,018,462	4,837,432	2,056,575	7,888,501	3,894,019	341,935
1971	24,103,973	22,493,012	22,676,581	19,637,212	4,971,690	2,172,699	8,163,562	3,992,983	336,278
1972	24,016,109	22,531,698	23,009,445	19,879,733	5,125,982	2,286,561	8,167,096	3,978,673	321,421
1973	24,067,202	22,647,549	22,965,914	19,825,271	4,879,387	2,288,041	8,743,514	3,605,333	308,996
1974	22,849,793	21,600,522	22,110,623	19,076,955	4,786,128	2,262,909	8,305,979	3,429,231	292,708

Source: U.S. Bureau of Mines

Table 3.2

Average Annual Natural Gas Prices in the United States (cents/MCF)

Year	Wellhead	Retail	Residential	Commercial	Industrial
1950	6.5	26.6	69.0	47.6	17.6
1951	7.3	29.8	76.0	52.9	19.2
1952	7.8	33.2	83.1	57.0	20.7
1953	9.2	35.5	86.5	61.0	22.7
1954	10.1	38.1	89.3	64.7	23.6
1955	10.4	40.0	88.7	62.7	25.7
1956	10.8	41.5	91.3	64.9	25.3
1957	11.3	43.1	93.0	68.9	26.4
1958	11.9	46.2	98.2	69.5	27.8
1959	12.9	47.7	101.1	72.1	29.4
1960	14.0	50.1	103.4	77.5	31.7
1961	15.1	51.0	107.0	77.8	31.2
1962	15.5	51.4	104.3	77.9	32.2
1963	15.8	51.2	104.5	78.6	32.2
1964	15.4	51.9	105.9	77.5	32.2
1965	15.6	52.2	104.8	77.3	38.4
1966	15.7	52.3	104.3	76.3	32.0
1967	16.0	51.9	104.3	77.9	31.7
1968	16.4	50.3	104.1	77.7	33.9
1969	16.7	51.5	104.7	78.2	34.8
1970	17.1	53.8	108.9	81.6	37.0
1971	18.2	57.5	114.9	86.7	40.9
1972	18.6	62.1	121.3	91.9	45.0
1973	21.6	66.3	128.7	97.6	50.0
1974	30.4	81.9	142.9	112.2	67.3

Source: U.S. Bureau of Mines

Table 3.3

Sales and Average Prices of Natural Gas
in the United States

Year	Sales (trillion BTU)					Average Price (cents/million BTU)				
	Total	Residential	Commercial	Industrial	Other	Total	Residential	Commercial	Industrial	Other
1950	4209	1384	410	2289	126	46.2	85.2	64.8	20.9	20.4
1951	4822	1620	456	2552	194	46.2	82.4	64.5	21.8	21.5
1952	5270	1735	493	2799	244	46.8	84.2	65.1	22.8	20.5
1953	5647	1804	498	3039	306	48.1	87.5	68.0	24.3	20.5
1954	6143	2003	540	3310	290	49.7	89.1	70.0	24.8	24.6
1955	6691	2239	603	3535	315	51.6	89.6	72.5	26.5	26.4
1956	7292	2464	656	3869	304	52.8	90.9	71.8	27.5	26.2
1957	7740	2599	699	4048	395	53.4	91.5	72.3	28.3	25.7
1958	8026	2812	765	4076	375	56.8	94.5	74.6	30.1	29.4
1959	8792	2974	827	4563	427	57.6	96.6	76.5	31.3	30.6
1960	9288	3188	920	4709	470	60.4	99.5	78.6	33.1	32.6
1961	9589	3321	988	4786	494	62.4	101.7	79.8	34.6	34.1
1962	10335	3536	1093	5100	505	63.2	101.7	80.2	35.3	33.8
1963	10766	3668	1137	5438	524	62.3	101.5	79.8	35.0	34.9
1964	11591	3870	1273	5912	536	61.5	100.6	78.6	34.6	35.6
1965	12013	4002	1346	6174	492	61.8	100.8	78.0	34.9	35.7
1966	12893	4178	1464	6682	569	61.0	100.3	77.7	35.0	36.0
1967	13488	4365	1578	7014	531	61.2	100.2	77.4	35.1	36.3
1968	14472	4553	1705	7595	620	60.6	100.3	77.4	35.2	36.0
1969	15391	4820	1878	8136	557	61.5	101.3	77.3	35.8	39.3
1970	16044	4924	2007	8439	674	64.3	105.8	80.5	37.6	40.6
1971	16680	5040	2156	8643	841	67.9	111.8	84.6	41.2	38.4
1972	17110	5148	2280	8798	883	73.0	118.5	90.6	44.9	40.9
1973	16484	4994	2283	8373	835	78.7	125.2	95.3	50.1	44.4
1974	16000	4865	2293	8153	689	96.0	142.1	111.1	68.0	60.0
1975	14863	4991	2387	6837	648	129.0	169.0	139.0	99.0	94.0

Source: American Gas Association

Table 3.4

Natural Gas Production and Consumption
in Montana (million cubic feet)

Year	Gross Withdrawal	Marketed Production	Consumption	Total Gas Delivered	Residential	Commercial	Industrial	Electric-Utilities	Other
1950	40975	38972	38333	35002	12596	7536	13979	892	NA
1951	36897	36225	37276	35598	12287	7379	15047	884	NA
1952	29140	28557	41545	38476	12263	7794	17422	998	NA
1953	28245	27736	40953	37368	12029	7544	16559	1237	NA
1954	30532	30087	41002	37101	13314	8277	14909	601	NA
1955	28841	28100	47861	43631	15335	9427	18240	630	NA
1956	26852	25706	48305	43651	15235	9314	18226	876	NA
1957	30830	28481	54868	48224	16725	10116	18429	2954	NA
1958	30830	27836	54725	46659	14970	9546	18960	3183	NA
1959	32819	30575	51898	45877	17310	11124	16438	1005	NA
1960	37792	33235	54271	48543	16825	11820	19558	339	NA
1961	36798	33716	57465	50985	17086	12140	21404	354	NA
1962	32621	29791	62952	54785	17078	12302	21713	3692	NA
1963	31228	29862	66969	57740	17274	12569	24613	3285	NA
1964	26653	25050	67282	60706	18792	13059	26419	2437	NA
1965	29800	28105	70895	64320	19908	14110	28310	1992	NA
1966	36048	30685	73829	66306	19690	14068	29571	2977	NA
1967	31610	25866	65782	58358	19756	13090	22584	502	2426
1968	32229	19313	63642	57148	19711	11529	23155	631	2122
1969	68064	41229	78988	71493	21463	14239	31917	1520	2354
1970	48302	42705	90823	81992	24794	15520	36105	2529	3044
1971	38136	32720	89021	81363	25379	15734	36800	1075	2375
1972	38137	33474	85161	77348	23787	16521	33192	1218	2630
1973	60931	56175	91148	84286	24923	16786	37898	2322	2357
1974	59524	54873	80766	74505	21590	14353	35202	1111	2249

Source: U.S. Bureau of Mines

Table 3.5

Average Annual Natural Gas Prices
in Montana (cents/MCF)

Year	Wellhead	Retail	Delivered	Residential	Commercial	Industrial
1950	5.3	28.7	30.1	47.3	32.8	14.2
1951	5.5	31.3	32.0	51.0	35.1	16.0
1952	6.1	31.8	32.4	50.7	35.2	19.2
1953	5.9	32.9	33.7	53.1	36.8	19.4
1954	6.8	37.5	38.8	58.9	41.5	20.1
1955	6.7	36.7	38.0	58.3	41.1	20.2
1956	6.8	36.8	38.2	58.5	41.2	20.6
1957	7.2	36.9	38.0	58.3	41.3	20.8
1958	6.8	38.4	40.1	64.7	44.3	21.8
1959	7.5	41.6	45.6	64.7	45.7	26.7
1960	7.1	41.6	45.4	66.0	46.4	27.4
1961	7.4	40.3	43.8	65.5	45.9	25.7
1962	7.4	41.9	46.4	75.2	50.6	25.1
1963	7.5	41.3	46.2	74.6	50.7	26.8
1964	7.8	45.7	49.5	76.3	53.3	30.3
1965	8.2	46.8	50.6	78.1	54.1	31.1
1966	8.3	45.8	49.5	77.9	54.3	30.4
1967	8.4	49.9	54.6	79.6	57.1	34.1
1968	9.1	50.9	55.4	82.2	60.3	32.6
1969	10.2	52.2	56.2	88.2	64.3	33.8
1970	10.3	52.9	57.2	90.7	65.9	33.9
1971	12.1	56.3	60.3	93.4	68.5	35.7
1972	12.3	58.7	63.0	96.5	69.1	38.1
1973	23.6	66.1	69.8	108.6	80.4	42.5
1974	25.2	75.8	80.4	111.9	92.6	58.0

Source: U.S. Bureau of Mines

Table 3.6

Sales and Average Prices of Natural Gas
in Montana

Year	Sales (trillion BTU)					Average Price (cents/million BTU)				
	Total	Residential	Commercial	Industrial	Other	Total	Residential	Commercial	Industrial	Other
1950	32.7	12.3	5.9	12.9	1.7	31.0	36.9	27.0	30.3	5.9
1951	35.9	12.5	6.7	15.0	1.7	32.3	49.7	35.8	17.2	22.9
1952	37.7	12.3	7.1	15.4	2.9	34.1	51.6	37.0	21.4	20.5
1953	36.3	12.1	7.0	15.5	1.7	35.2	52.7	37.8	21.6	23.9
1954	36.9	13.4	7.7	14.1	1.7	36.8	52.6	38.7	22.3	24.2
1955	43.5	15.4	8.7	17.6	1.8	36.1	52.0	38.3	22.4	24.1
1956	45.4	15.8	9.0	18.8	1.8	35.1	51.0	37.7	21.8	24.2
1957	46.9	17.0	9.6	18.4	1.9	40.2	57.4	41.8	25.0	24.9
1958	46.6	16.3	9.1	19.3	1.9	41.4	59.1	43.1	27.0	27.0
1959	48.5	18.9	10.8	16.6	2.2	43.3	58.9	43.5	27.6	27.6
1960	51.3	18.5	11.0	19.8	2.0	43.2	60.1	45.2	27.6	29.2
1961	53.1	18.7	11.5	20.8	2.1	42.7	59.8	44.5	27.9	26.9
1962	55.5	19.4	12.0	21.9	2.2	46.1	65.7	47.1	29.8	30.1
1963	57.3	19.0	11.7	24.4	2.2	47.6	68.9	49.6	31.6	33.0
1964	63.3	21.1	13.2	26.6	2.4	47.5	68.2	49.2	31.6	32.8
1965	67.4	22.6	14.4	28.0	2.5	47.4	68.1	49.3	31.1	32.1
1966	66.9	22.0	14.2	28.2	2.5	48.0	69.4	50.2	31.6	33.1
1967	64.4	21.9	14.7	25.3	2.6	50.9	71.7	51.9	34.0	33.1
1968	66.2	22.4	14.6	26.6	2.7	52.3	75.4	55.7	33.0	32.9
1969	74.1	23.7	15.5	32.2	2.7	53.7	79.9	59.0	33.4	35.3
1970	78.8	23.5	15.4	36.4	3.5	54.4	84.2	62.1	33.6	36.1
1971	79.0	24.4	15.9	35.6	3.0	55.3	84.6	62.7	33.4	37.7
1972	82.8	25.9	16.9	36.7	3.3	57.2	87.1	64.5	34.4	39.4
1973	81.7	24.7	16.3	36.5	4.2	64.7	97.5	73.0	41.3	45.2
1974	78.7	23.8	15.7	36.1	3.1	76.0	102.0	88.0	57.0	58.0
1975	79.8	26.3	17.6	32.6	3.3	103.0	118.0	102.0	92.0	88.0

Source: American Gas Association

Table 3.7

Production, Average Wellhead Prices and Distribution of Natural Gas in Montana

Year	Production[1] (MMCF)	Production[2] (MMCF)	Average Wellhead[2] Price (cents/MCF)	Natural Gas[2,3] Distributed (MMCF)
1950	39708	39010	5.0	29616
1951	39038	36123	5.3	31448
1952	30409	27939	5.7	34742
1953	31779	28592	6.3	34365
1954	31150	29765	6.0	35070
1955	30468	30227	5.2	36409
1956	29356	28350	6.1	41121
1957	32979	31413	6.0	41421
1958	31327	27689	6.5	31947
1959	31585	30551	6.0	44471
1960	35381	30411	6.8	43490
1961	34884	32407	6.4	46072
1962	28973	29417	6.1	50534
1963	27113	25504	6.6	49694
1964	25234	23592	6.6	53323
1965	27873	26285	6.5	58791
1966	32414	29041	8.1	60953
1967	31619	29276	7.9	60560
1968	31917	28831	8.8	57249
1969	41229	37804	7.2	66856
1970	37445	35225	8.1	67252
1971	38137	28775	8.2	74236
1972	35606	32171	10.0	72831
1973	58896	56383	15.9	73197
1974	51401	41753	25.2	72184
1975	44546	NA	NA	NA

[1]Source: Montana Oil and Gas Conservation Division

[2]Source: Montana Department of Revenue

[3]Data is for fiscal year ending June 30 of year shown

Table 3.8

Montana Imports and Exports of Natural Gas
(million cubic feet)

Year	Total[1,2] Imports	Total[1,3] Exports	Net Imports (Exports)	Net Import (Export) Of Natural Gas by Source				Northern Natural Exports[3]
				Montana-Dakota Utilities[1]			MPC[2]	
				N. Dakota	S. Dakota	Wyoming	Canada	
1950	2,791	6,688	(3,897)	(2,974)	(3,094)	2,171	0	
1951	11,788	7,817	3,971	(3,338)	(4,014)	11,323	0	
1952	20,385	6,972	13,413	(3,140)	(3,500)	12,293	7,760	
1953	23,189	8,164	15,025	(3,213)	(4,570)	13,633	9,175	
1954	21,361	10,065	11,296	(3,947)	(5,813)	14,246	6,810	
1955	30,297	11,651	18,646	(4,546)	(6,671)	19,042	10,821	
1956	33,071	11,884	21,187	1,223	(8,014)	17,661	10,317	
1957	36,040	11,461	24,579	1,581	(7,560)	20,296	10,262	
1958	36,569	10,926	25,643	1,387	(6,739)	18,412	12,583	
1959	40,813	13,792	27,021	531	(8,586)	20,990	14,086	
1960	44,362	13,630	30,732	1,750	(8,691)	21,043	16,630	
1961	42,032	14,001	28,031	715	(8,869)	20,586	15,599	
1962	54,660	12,658	42,002	3,969	(8,815)	19,255	27,593	
1963	59,021	9,827	49,194	10,563	(8,515)	20,318	26,828	
1964	64,542	10,512	54,030	10,603	(9,295)	25,359	27,364	
1965	64,512	10,294	54,218	8,206	(8,417)	25,124	29,305	
1966	66,811	12,073	54,738	7,593	(9,268)	25,402	31,011	
1967	65,927	11,602	54,325	7,262	(9,352)	25,752	30,663	
1968	65,787	12,281	53,506	6,493	(9,424)	20,137	36,300	
1969	72,778	16,461	56,317	4,558	(9,505)	21,464	39,800	
1970	88,501	21,241	67,260	3,448	(9,323)	30,535	42,600	
1971	84,997	18,851	66,146	1,310	(10,218)	30,454	44,600	
1972	85,335	24,136	61,199	(283)	(12,193)	27,615	48,600	2,540
1973	83,979	46,630	37,349	(1,340)	(12,448)	29,583	50,000	28,446
1974	84,901	44,980	39,921	(6,457)	(11,923)	30,946	47,152	19,797
1975	69,109	39,131	29,978	(7,481)	(12,613)	23,419	42,197	15,544

[1]Source: Montana-Dakota Utilities
[2]Source: U. S. Bureau of Mines
[3]Source: Montana Department of Natural Resources, Oil and Gas Conservation Division.

Table 3.9

Sales of Natural Gas in Montana[1]
by Gas Utilities (MMCF)
(Continued on next page)

Year	Montana Power Company						Montana-Dakota Utilities				
	Residential and Commercial	Industrial	Other	Total	% of Total Sales	Sales to Canada	Residential and Commercial	Industrial	Other	Total	% of Total Sales
1950	8,648	8,942	705	18,295	56	0	4,228	240	469	4,937	15
1951	8,848	13,055	720	22,623	61	0	5,514	1,180	499	7,193	19
1952	NA	NA	NA	NA	NA	NA	7,340	1,845	468	9,653	NA
1953	8,848	13,700	719	23,267	63	0	7,223	1,863	480	9,566	26
1954	9,406	12,323	746	22,474	61	0	7,912	1,649	495	10,056	27
1955	12,204	15,621	826	28,652	65	0	7,594	1,996	533	10,123	23
1956	12,076	15,720	788	28,584	65	0	7,708	2,212	509	10,429	24
1957	13,661	15,677	834	30,171	66	0	7,797	2,056	492	10,345	23
1958	13,445	15,334	836	29,615	64	0	7,429	3,233	551	11,213	24
1959	15,576	12,802	1,025	29,402	62	0	8,678	2,934	507	12,119	25
1960	15,604	15,641	1,150	32,396	64	0	8,516	3,148	342	12,006	24
1961	15,567	16,824	1,165	33,556	64	0	8,689	3,606	177	12,472	24
1962	16,233	18,265	1,211	35,709	66	0	9,148	3,051	103	12,302	23
1963	15,901	19,831	1,265	36,998	66	0	8,826	3,862	79	12,767	23
1964	18,031	21,131	1,396	40,558	66	0	9,620	4,687	55	14,362	23
1965	19,255	22,382	1,452	43,106	65	0	10,955	4,430	61	15,446	23
1966	18,954	23,256	1,456	43,666	67	90	10,414	4,256	55	14,725	22
1967	19,255	20,977	1,528	41,760	66	106	10,584	3,813	67	14,464	23
1968	20,327	21,871	1,645	43,843	66	104	10,847	4,523	65	15,435	23
1969	21,177	25,758	1,669	48,604	66	112	11,534	6,277	55	17,866	24
1970	21,897	27,709	1,591	51,197	65	109	11,499	8,582	102	20,183	26
1971	22,060	26,339	1,637	50,036	65	113	11,612	8,317	139	20,068	26
1972	23,142	27,525	1,682	52,349	65	126	12,352	8,218	600	21,170	26
1973	22,896	26,791	1,686	51,373	64	88	11,525	8,685	1,415	21,623	27
1974	21,831	26,492	1,589	49,912	65	31	11,230	8,455	588	20,273	26
1975	23,942	24,484	1,717	50,143	64	66	12,785	7,244	586	20,615	26

Table 3.9 Cont'd.

Year	Great Falls Gas Company					Other Utilities		Total Sales			
	Residential and Commercial	Industrial	Other	Total	% of Total Sales	Total for all Sectors	% of Total Sales	Residential and Commercial	Industrial	Other	Total
1950	2509	208	53	2770	9	6481	20	21866	9390	1227	32483
1951	2697	311	191	3200	9	4055	11	21114	14546	1410	37070
1952	2566	228	333	3127	NA	852	NA	NA	NA	NA	NA
1953	2478	238	350	3066	8	814	2	19363	15801	1549	36713
1954	2795	255	400	3450	9	892	2	21005	14227	1641	36873
1955	3284	243	434	3961	9	1049	2	24131	17860	1793	43784
1956	3361	204	396	3961	9	1019	2	24261	17966	1674	43901
1957	3510	258	451	4219	9	955	2	25923	17991	1777	45691
1958	3365	268	475	4108	9	1067	2	25306	18835	1862	46003
1959	4048	388	566	5002	10	1175	2	29477	16124	2098	47699
1960	3928	512	516	4956	10	1152	2	29200	19301	2008	50509
1961	4067	380	606	5053	10	1045	2	29368	20810	1948	52126
1962	4092	371	752	5215	10	1078	2	30551	21687	2066	54304
1963	4030	396	793	5219	9	945	2	29702	24089	2137	55928
1964	4446	480	847	5773	9	1018	2	33115	26298	2298	61711
1965	4767	499	868	6133	9	1160	2	36137	27311	2381	65829
1966	4593	490	846	5928	9	1125	2	35086	28002	2357	65445
1967	4505	397	856	5757	9	1160	2	35504	25187	2451	63142
1968	4504	424	852	5780	9	1074	2	36752	26818	2562	66132
1969	5042	412	891	6344	9	1118	1	38871	32447	2615	73933
1970	4926	378	902	6206	8	1010	1	39332	36669	2595	78596
1971	4901	367	895	6163	8	1048	1	39621	35023	2671	77315
1972	5185	353	884	6421	8	1105	1	41784	36096	3166	81046
1973	4729	414	864	6006	8	982	1	40132	35890	3965	79987
1974	4504	412	807	5723	7	936	1	38501	35359	2984	76844
1975	5145	354	845	6343	8	1000	1	42873	32082	3148	78101

[1]Excludes all sales for resale. See appendix for additional notes.
Source: Annual Reports by Gas Utilities to the Montana Public Service Commission.

Table 3.10
Consumption of Natural Gas by
Mining and Manufacturing in Montana in 1974
(million cubic feet)

SIC Code		1974 Consumption		
		Firm	Interruptible	Total
10-14	Mining		3,367	3,367
20	Food and Kindred Products	1,270		1,270
24	Lumber and Wood Products		900	900
25	Furniture and Fixtures	363		363
26	Paper and Allied Products		4,700	4,700
27	Printing and Publishing	508		508
28	Chemicals and Allied		1,100	1,100
29	Petroleum and Coal Products		6,195	6,195
32	Stone, Clay, Glass, and Concrete Products		4,400	4,400
33	Primary Metals		13,100	13,100
34	Fabricated Metal Products	436		436
36	Electronic Equipment	327		327
37	Transportation Equipment		300	300
39	Other Manufacturing	546		546
	Not classified/Unreported		198	198
	Total Consumption	3,450	34,260	37,710

Source: Gas Requirements Agency, University of Denver Research Institute

IV. CRUDE PETROLEUM AND PETROLEUM PRODUCTS STATISTICS

Table 4.1

Capacity of Petroleum Refineries
in the U.S. and Montana as of 1/1/75

Region or Refinery	Crude Oil Distillation					Cracking, reforming, coking and alkylation				
	Crude Oil throughput Capacity (Barrels per calender day)					Gasoline Output Capacity (Barrels per calender day)				
	Operable			Inoperable	Total	Type of Process	Operating	Shutdown		Total
	Total	Operating	Shutdown	Shutdown				Operable	Inoperable	
U. S. Total	14,960,710	14,696,750	263,960	208,100	15,168,810	total	6,815,347	124,652	147,350	7,087,349
Montana Total	160,931	157,431	3,500	-	160,931	total	77,426	-	300	77,726
Big West Oil	5,123	5,123	-	-	5,123	Cat Rf	888	-	-	888
						Thml Ck	468	-	-	468
Continental Oil	52,500	52,500	-	-	52,500	Cat Ck	8,300	-	-	8,300
						Cat Rf	10,900	-	-	10,900
						Alk.	3,350	-	-	3,350
Diamond Asphalt	1,000	-	1,000	-	1,000	-	-	-	-	-
Exxon Company	45,000	45,000	-	-	45,000	Cat Ck	10,900	-	-	10,900
						Cat Rf	11,700	-	-	11,700
						Hydro.	4,400	-	-	4,400
						Cok.	850	-	-	850
						Alk.	3,200	-	-	3,200
Farmers Union	41,650	41,650	-	-	41,650	Cat Ck	10,300	-	-	10,300
						Cat Rf	5,600	-	-	5,600
						Alk.	3,400	-	-	3,400
Jet Fuel Refinery	1,000	-	1,000	-	1,000	-	-	-	-	-
John Wight, Inc.	1,500	-	1,500	-	1,500	-	-	-	-	-
Phillips Petroleum	6,000	6,000	-	-	6,000	Cat Ck	1,100	-	-	1,100
						Cat Rf	550	-	-	550
Tesoro Petroleum	2,500	2,500	-	-	2,500	Thml Ck	-	-	300	300
Westco Refining	4,658	4,658	-	-	4,658	Cat Rf	760	-	-	760
						Thml Ck	760	-	-	760

Source: U.S. Bureau of Mines, Annual Refining Survey.

Table 4.2

Refinery Capacity Compared to Crude Oil throughput for 1974 and 1975

Region or Refinery	Total Operating Crude Oil throughput Capacity as of 1/1/75 (barrels/day) [1]	Average Crude Oil throughput (barrels/day) [2]		Throughput as Percent of Capacity	
		1974	1975	1974	1975
United States Total	14,696,750	12,133,425	12,442,191	82.6	84.7
Montana Refineries					
Big West Oil, Kevin	5,123	3,997	3,312	78.0	64.7
Continental Oil, Billings	52,500	45,896	45,129	87.4	86.0
Exxon, Billings	45,000	39,362	41,370	87.5	91.9
Farmers Union, Laurel	41,650	30,663	30,625	73.6	73.5
Phillips Petr., Great Falls	6,000	5,852	5,912	97.5	98.5
Tesoro Petr., Wolf Point	2,500	1,679	1,890	67.2	75.6
Westco Ref., Cut Bank	4,658	4,203	3,540	90.2	76.0
Montana Total	157,431	131,652	131,778	83.6	83.7

1/ See Table 4.1.
2/ Montana data from Montana Oil and Gas Conservation Division; U. S. data from U. S. Bureau of Mines.

Table 4.3

United States Petroleum Statistics
(million barrels)

Year	Domestic Crude Oil Production	Average Wellhead Price	Net Imports of Crude Oil	Net Imports of Finished Products	Refinery Runs to Stills
1951	2247.7	$2.53/bbl	152.5	3.7	2370.4
1952	2289.8	2.53	182.9	7.4	2441.9
1953	2357.1	2.68	216.5	14.4	2554.9
1954	2315.0	2.78	225.9	28.3	2539.6
1955	2484.5	2.77	273.9	48.6	2730.2
1956	2617.3	2.79	313.2	55.0	2905.1
1957	2616.9	3.09	323.0	44.4	2890.4
1958	2449.0	3.01	343.7	176.3	2789.4
1959	2574.6	2.90	350.0	222.7	2917.7
1960	2574.9	2.83	368.5	223.3	2952.5
1961	2621.8	2.89	378.3	257.8	2987.2
1962	2676.2	2.90	409.2	289.2	3069.6
1963	2752.7	2.89	411.0	287.8	3170.7
1964	2786.8	2.88	437.3	315.6	3223.3
1965	2848.5	2.86	450.9	382.0	3300.8
1966	3027.8	2.88	445.6	421.1	3447.2
1967	3215.7	2.92	385.1	428.8	3582.6
1968	3329.0	2.94	470.5	484.3	3774.4
1969	3371.8	3.09	512.7	558.0	3879.6
1970	3517.5	3.18	478.3	675.3	3967.5
1971	3453.9	3.39	612.9	736.0	4087.8
1972	3455.4	3.39	811.1	765.8	4280.9
1973	3360.9	3.89	1183.3	926.3	4537.3
1974	3202.6	6.74	1267.7	805.8	4428.7
1975	3052.0	7.56	1496.1	586.6	4541.4

Source: U.S. Bureau of Mines

Table 4.4

Crude Oil Production (1000 barrels) and
Average Wellhead Prices (Dollars per barrel)
in Montana

Year	Production[1] of Crude Oil	Wellhead[2] Price	Production[3] of Crude Oil	Wellhead[3] Price
1950	8109	2.52	7841	2.47
1951	8958	2.47	8814	2.35
1952	9606	2.25	9527	2.26
1953	11920	2.18	11793	2.23
1954	14195	2.20	14023	2.22
1955	15654	2.26	16548	2.18
1956	21760	2.58	21262	2.47
1957	27122	2.70	26658	2.43
1958	27957	2.65	27816	2.62
1959	29857	2.56	29985	2.50
1960	30240	2.41	29937	2.45
1961	30906	2.42	30499	2.42
1962	31648	2.42	31270	2.44
1963	30870	2.44	30364	2.44
1964	30647	2.43	30241	2.45
1965	32778	2.43	32089	2.44
1966	35380	2.44	34734	2.45
1967	34959	2.50	34316	2.50
1968	48460	2.57	47152	2.56
1969	43954	2.69	44446	2.76
1970	37879	2.78	38058	2.83
1971	34599	3.01	34625	3.05
1972	33904	3.07	34572	2.99
1973	34620	3.33	34584	3.85
1974	34554	6.65	34629	6.82
1975	32844	7.83	NA	NA

[1]Source: Montana Oil and Gas Conservation Division

[2]Source: U.S. Bureau of Mines [3]Source: Montana Department of Revenue

Table 4.5

Crude Oil Refined in Montana Refineries
By Source of Crude (1,000 barrels)

	Continental Oil (Billings)				Exxon (Billings) 1/				Farmers Union (Laurel)			
Year	Montana	Wyoming	Canada	Total	Montana	Wyoming	Canada	Total	Montana	Wyoming	Canada	Total
1953	337	2753		3089	1067	6277		7344	949	3083		4032
1954	623	2277		2909*/	1641	5355		6995	1618	3234		4853
1955	1268	2077		3358*/	1778	5225		7004	1446	3908		5354
1956	560	2671		3231	1352	7095		8447	1916	3936		5852
1957	681	2795		3475	1777	6602		8378	1830	4249		6078
1958	807	2313		3120	2316	4445		6792	1395	3113		4509
1959	971	2793		3765	4414	6760		11173	1215	5589		6804
1960	728	3422		4151	3634	6175		9808	2008	4786		6794
1961	729	3955		4685	3583	5991		9574	1859	4092		5951
1962	1954	3434	185	5573	2519	9496	12	12028	2754	3740		6495
1963	2418	2241	1046	5705	2200	8739	495	11435	2974	3425		6699
1964	3732	1548	3692	8973	2275	9530	288	12093	2723	4603		7326
1965	2697	3068	4593	10359	2293	9659	37	11989	2635	3665		6300
1966	1773	4148	4674	10595	2318	9557	0	11875	2079	4415		6494
1967	1813	3936	5052	10802	2073	11851	0	13924	1833	5606		7439
1968	1714	1995r	10125r	13834	1451	12387	222	14060	1264	6533		7797
1969	1637	3443r	8482r	13562	1240	11964	360	13564	1539	6723		8261
1970	1351	3345r	9123r	13820	1090	11062	2381	14532	1355	4935	2404	8695
1971	1170	3592r	10070r	14833	1046	10997	2564	14607	1526	5143	3369	10038
1972	1119	3796r	12240r	17154	849	10821	3706	15376	1703	4625	4229	10556
1973	1046	3272r	12170r	16488	1089	10011	5568	16668	1672	4952	5299	11922
1974	1340	4299r	11113r	16752	744	8753	4870	14367	1599	3897	5697	11192
1975	1703	5478r	9291r	16472	879	8615	5606	15100	1466	5373	4339	11178

1/ Formerly Humble Oil (1960-1972) and Carter Oil (1953-1959).
*/ Includes 9,000 barrels from South Dakota in 1954 and 13,000 barrels from South Dakota in 1955.
r Revised by the Montana Energy Advisory Council.

(continued)

Table 4.5 Cont'd.

Year	Big West Oil (Kevin)			Phillips (Great Falls)			Tesoro (Wolf Point) 2/			Westco (Cut Bank) 3/		
	Montana	Canada	Total	Montana	Canada	Total	Montana	Canada	Total	Montana	Canada	Total
1953	686		686	857		857				1305		1305
1954	652		652	839		839				1252		1252
1955	705		705	874		874				1279		1279
1956	729		729	997	7	1004	86		86	1257	47	1304
1957	742		742	831	16	847	98		98	1258	54	1312
1958	751		751	995		995	45		45	1203	12	1215
1959	805		805	1226		1226	55		55	1175	4	1180
1960	775		775	1298		1298	17		17	1142	21	1162
1961	831		831	1318		1318	0		0	1099	14	1114
1962	852	3	855	1436		1436	0		0	1050	41	1091
1963	916		916	1616		1616	0		0	1130	11	1141
1964	920		920	1491		1491	78		78	880	21	901
1965	1034		1034	1500		1500	508		508	1134	24	1158
1966	765		765	1619		1619	681		681	1159	9	1169
1967	967		967	1770		1770	747		747	1191		1191
1968	1290		1290	1690		1690	820		820	1258		1258
1969	1101		1101	1609		1609	861		861	1274		1274
1970	1207		1207	1691		1691	806		806	1388		1388
1971	1136		1136	1955		1955	843		843	1371		1371
1972	523r	705r	1228r	2120		2120	765		765	954r	276r	1230r
1973	675r	784r	1469	2220		2220	668		668	1057r	464r	1513r
1974	519r	940r	1459	2056	81	2136	590	23	613	1142r	392r	1534r
1975	398r	820r	1218r	1724	433	2158	687	4	690	1145r	166r	1311r

2/ Formerly Texstar Petroleum (1959-1964) and the Texas-Calgary Co. (1956-1958).
3/ Formerly Union Oil Company (1953-1970).
r Revised by the Montana Energy Advisory Council.

(continued)

Table 4.5 Cont'd.

Year	Diamond Asphalt (Chinook)			Jet Fuel Refinery (Mosby)			Other Refineries 4/	
	Montana	Canada	Total	Montana	Wyoming	Total	Montana	Total
1953	0		0	26		26	2272	2272
1954	74		74	175		175	2161	2161
1955	241		241	127		127	2139	2139
1956	215	33	249	113	18	131	1828	1828
1957	195	10	205	138	20	158	1673	1685 */
1958	202		202	121	5	127	1299	1299
1959	277		277	179		179	595	595
1960	218		218	116		116	595	595
1961	236	19	255	110		110	31	31
1962	186	22	207	51	37	92 **/	373	373
1963	148		148	326	40	366	70	70
1964	95		95	57		57	41	41
1965	111		111	58		58		
1966	165		165	66		66		
1967	173		173	65		65		
1968	173		173	30		30		
1969	174		174	30		30		
1970	158		158	34		34		
1971	190		190	25		25		
1972	144		144	19		19		
1973	3		3	7		7		
1974	0		0	0		0		
1975	0		0	0		0		

*/ Includes 12,000 barrels to Unity Petroleum Company from Canada in 1957.
**/ Includes 4,000 barrels from Canada in 1962.
4/ Includes Modern Oil Company (1953-1954), Texaco Incorporated (1953-1960), Unity Petroleum Company (1957-1958), PetroFuels Company (1961-1964), and North Star Refinery (1964).

(continued)

Table 4.5 Cont'd.

Total Crude Oil Refined in Montana by Source

Year	Montana	Percent of Total	Wyoming	Percent of Total	Canada	Percent of Total	Total
1953	7497	38.3	12112	61.7	0	0.0	19609
1954	9034	45.4	10865	54.5	0	0.0	19909 */
1955	9858	46.8	11210	53.1	0	0.0	21081 */
1956	9053	39.6	13720	60.0	88	0.4	22861
1957	9222	40.1	13665	59.5	92	0.4	22979
1958	9165	39.4	14089	60.5	12	0.1	23265
1959	10913	41.9	15141	58.1	4	0.0	26059
1960	10531	42.3	14383	57.7	21	0.1	24935
1961	9797	41.0	14038	58.8	33	0.1	23869
1962	11175	39.7	16708	59.4	266	0.9	28149
1963	11798	42.0	14745	52.5	1553	5.5	28097
1964	12292	38.4	15714	49.1	4002	12.5	32007
1965	11971	36.2	16416	49.7	4654	14.1	33041
1966	10626	31.8	18120	54.2	4684	14.0	33429
1967	10632	28.7	21393	57.7	5052	13.6	37078
1968	9690	23.7	20915r	51.0	10347r	25.2	40951
1969	9465	23.4	22130r	54.7	8843r	21.9	40438
1970	9080	21.5	19342r	45.7	13908r	32.8	42330
1971	9262	20.6	19732r	43.8	16003r	35.6	44997
1972	8194r	16.9	19241r	39.6	21156r	43.5	48591r
1973	8437r	16.9	18235r	35.8	24295r	47.7	50967r
1974	7989r	16.6	16949r	35.3	23115r	48.1	48053
1975	8002r	16.6	19465r	40.4	20690r	43.0	48157r

*/ Includes 9,000 barrels from South Dakota in 1954 and 13,000 barrels from South Dakota in 1955.

r Revised by the Montana Energy Advisory Council.

Source: Montana Oil and Gas Conservation Division.

Table 4.6

Refinery Receipts of Crude Oil by Source
(1000 Barrels)

Year	Montana Crude	Percent of Total	Wyoming Crude	Percent of Total	Canadian Crude	Percent of Total	Total	Crude Runs To Stills	Shipments of Crude to out-of-state Refineries
1950	6654	41.5	9381	58.5	0	0.0	16035	16057	NA
1951	6734	38.0	11001	62.0	0	0.0	17735	17890	NA
1952	6486	34.1	12502	65.9	0	0.0	18988	19116	NA
1953	7204	36.5	12529	63.5	0	0.0	19733	19575	NA
1954	8275	41.8	11469	58.2	0	0.0	19747	19775	4157
1955	9033	43.4	11792	56.6	0	0.0	20837	20931	3829
1956	8344	36.2	14622	63.5	70	0.3	23036	22828	8852
1957	8274	36.1	14522	63.5	86	0.4	22882	22862	13367
1958	7795	33.6	15330	66.3	13	0.1	23138	23358	14413
1959	9123	34.8	17052	65.0	15	0.1	26190	26111	13636
1960	9538	38.1	15476	62.8	20	0.1	25034	25004	17408
1961	8707	36.5	15111	63.4	30	0.1	23848	23887	18150
1962	9353	33.3	18422	65.5	309	1.1	28084	28088	19043
1963	9382	33.5	17028	60.8	1592	5.7	28002	28056	20029
1964	10070	31.5	17865	55.8	4062	12.7	31997	32028	18771
1965	11428	34.5	17143	51.7	4571	13.8	33142	33091	19046
1966	12286	36.5	16724	49.6	4684	13.9	33694	33671	20395
1967	11960	32.7	18291	49.9	6361	17.4	36612	36432	21326
1968	10959	27.1	20084	49.7	9362	23.2	40405	40370	23704
1969	12831	31.9	16497	41.0	10836	27.0	40164	40199	22604
1970	11330	27.2	15043	36.1	15313	36.7	41686	41363	17982
1971	11972	28.8	14784	35.6	14767	35.6	41523	41899	15032
1972	13353	32.3	16439	39.8	11529	27.9	41321	41049	15439
1973	10534	24.3	19807	45.6	13012	30.0	43353	43465	22591
1974	10006	24.4	18151	44.2	12890	31.4	41047	40771	22638
1975	9766	23.1	19805	46.9	12656	30.0	42239*	42589	20513

* Includes 12,000 barrels from North and South Dakota in 1975.
Source: U.S. Bureau of Mines

Table 4.7

Distribution of Montana Crude Oil Exports
by State of Destination
(thousand barrels)

Destination	1973	1974	1975
Pennsylvania	346	360	769
Illinois	3,096	2,608	2,236
Indiana	13,720	14,435	10,907
Kansas	1,638	1,065	1,020
Minnesota, Wisconsin	1,199	1,617	2,026
Missouri, Nebraska	0	80	654
North Dakota	1,065	1,374	1,304
Ohio	80	115	59
Oklahoma	0	50	0
Colorado	793	573	256
Wyoming	654	361	498
Utah	0	0	784
Total	22,591	22,638	20,513

Source: U. S. Bureau of Mines.

Table 4.8

Production and Consumption
of Gasoline in Montana
(1000 barrels)

Year	Gasoline[1] Manufactured	Gasoline[1] Imported	Gasoline[1] Exported	Gasoline[1] Sold	Production[2] of Gasoline	Consumption[2] of Gasoline
1950	6,981	513	2,057	5,438	6,756	5,389
1951	7,899	570	2,930	5,540	7,732	5,533
1952	8,235	611	2,902	5,944	8,158	5,944
1953	8,742	592	3,206	6,127	8,926	6,127
1954	8,452	632	2,716	6,369	8,637	6,367
1955	8,991	574	2,974	6,592	8,967	6,580
1956	10,106	534	3,711	6,929	9,621	6,929
1957	10,604	561	4,264	6,906	9,856	6,906
1958	11,438	548	5,081	6,966	9,518	6,966
1959	12,590	491	5,781	7,301	10,452	7,302
1960	12,129	475	5,090	7,513	10,539	7,513
1961	11,284	337	3,789	7,831	10,328	7,930
1962	12,596	406	4,294	8,707	11,943	8,753
1963	12,320	450	4,028	8,741	12,733	8,848
1964	12,591	289	4,214	8,666	15,304	8,631
1965	13,751	282	4,731	9,303	15,603	9,349
1966	13,910	185	4,952	9,143	17,014	9,350
1967	14,565	326	5,115	9,776	18,757	9,458
1968	14,320	223	5,183	9,360	21,210	9,560
1969	14,629	275	5,104	9,800	21,397	9,664
1970	13,007	194	3,952	9,249	22,233	10,125
1971	13,613	214	4,090	9,737	23,922	10,598
1972	14,390	219	4,251	10,358	27,053	10,899
1973	15,191	634	4,792	11,033	27,313	11,305
1974	14,923	229	4,495	10,657	27,133	10,667
1975	15,498	176	4,759	10,914	NA	NA

[1] Source: Montana Department of Revenue

[2] Source: U.S. Bureau of Mines

Table 4.9

Consumption of Motor Fuels in Montana
(1000 barrels)

Year	Total Use of Motor Fuel	Highway Use of Motor Fuel			Nonhighway Use of Motor Fuel	Losses due to evaporation, handling, etc.
		Total	Gasoline	Diesel and LPG		
1950	5,553	4,208	4,027	181	1,262	83
1951	5,764	4,641	4,410	231	1,038	85
1952	6,239	4,777	4,482	295	1,370	92
1953	6,464	5,460	5,123	337	911	93
1954	6,772	5,275	4,870	405	1,401	96
1955	6,989	5,459	5,047	412	1,436	94
1956	7,364	5,990	5,569	421	1,271	103
1957	7,400	5,777	5,302	475	1,554	69
1958	7,479	6,216	5,703	513	1,193	70
1959	7,928	6,321	5,694	627	1,535	72
1960	8,161	6,420	5,772	648	1,666	75
1961	8,674	6,470	5,726	744	2,124	80
1962	8,320	7,247	6,525	722	986	87
1963	8,376	7,169	6,373	796	1,118	89
1964	8,446	7,344	6,504	840	1,016	86
1965	8,866	7,609	6,683	926	1,164	93
1966	9,153	8,093	7,063	1,030	970	90
1967	9,260	8,116	7,148	968	1,049	95
1968	9,806	8,743	7,654	1,089	967	96
1969	10,114	9,353	8,166	1,187	664	97
1970	10,826	9,781	8,397	1,384	944	101
1971	11,216	10,321	8,862	1,459	794	101
1972	12,147	11,039	9,393	1,646	1,004	104
1973	13,091	12,124	10,292	1,832	856	111
1974	12,411	11,547	9,810	1,737	758	106

Source: U.S. Department of Transportation

Table 4.10

Sales of Petroleum Products in Montana
(1000 barrels)

Year	Distillate Fuel Oil	Residual Fuel Oil	Kerosene	LPG
1950	2,478	4,222	231	211
1951	2,851	4,958	267	275
1952	3,063	4,220	277	324
1953	3,553	3,276	252	402
1954	3,755	1,751	261	537
1955	3,980	1,692	215	537
1956	4,219	1,646	213	610
1957	4,209	1,554	201	661
1958	3,642	1,643	303	296
1959	4,474	2,006	544	811
1960	4,713	2,022	476	737
1961	4,589	2,533	359	856
1962	5,522	3,049	265	819
1963	5,400	2,836	348	765
1964	5,684	2,356	651	931
1965	5,041	1,195	248	926
1966	5,802	1,371	117	1,165
1967	3,459	1,189	860	1,585
1968	4,119	1,495	816	1,685
1969	4,669	1,524	656	1,690
1970	4,823	1,249	376	1,327
1971	5,101	1,236	362	1,403
1972	6,121	1,485	383	1,704
1973	6,924	1,705	405	1,502
1974	7,646	2,290	174	1,465
1975	7,459	2,185	126	NA

Source: U.S. Bureau of Mines

Table 4.11

Sales of Distillate Fuel Oil
in Montana by Sector
(1000 barrels)

Year	Heating	Industrial	Electric Utility	Oil Company	Military	Railroads	Other		Total
							Diesel	Total	
1960	902	141	0	7	57	2,241	1,312	1,365	4,713
1961	1,132	125	0	9	29	1,880	1,288	1,414	4,589
1962	1,324	220	0	12	26	1,720	1,946	2,220	5,522
1963	1,307	213	0	47	41	1,701	1,868	2,088	5,400
1964	1,080	361	0	39	38	1,833	2,050	2,330	5,684
1965	1,096	210	0	15	17	1,632	2,026	2,067	5,041
1966	1,092	257	0	22	0	1,464	2,662	2,967	5,802
1967	829	99	0	2	11	1,362	NA	1,156	3,459
1968	1,045	114	0	10	16	1,270	1,423	1,664	4,119
1969	1,197	148	14	60	20	1,469	1,537	1,761	4,669
1970	1,011	144	0	14	26	1,623	1,808	2,005	4,823
1971	1,095	136	0	18	22	1,674	2,026	2,156	5,101
1972	1,219	774	9	40	43	1,808	1,988	2,228	6,121
1973	1,337	890	159	31	29	1,918	NA	2,560	6,924
1974	1,346	1,090	49	35	28	2,302	2,430	2,796	7,646
1975	1,425	1,236	59	38	35	1,999	2,305	2,667	7,459

Source: U.S. Bureau of Mines

Table 4.12

Sales of Residual Fuel Oil
in Montana by Sector
(1000 barrels)

Year	Heating	Industrial	Electric Utility	Oil Company	Military	Railroads	Other	Total
1960	354	439	2	817	70	299	41	2,022
1961	465	649	0	756	151	455	57	2,533
1962	1,011	568	0	931	86	385	68	3,049
1963	879	652	3	807	11	396	88	2,836
1964	503	664	53	712	9	299	116	2,356
1965	504	65	0	257	0	313	56	1,195
1966	482	56	45	342	118	263	65	1,371
1967	419	48	6	296	102	228	90	1,189
1968	419	102	23	681	56	185	29	1,495
1969	226	232	105	683	54	179	45	1,524
1970	183	109	9	792	45	74	37	1,249
1971	177	225	0	732	45	40	17	1,236
1972	209	227	16	967	32	32	2	1,485
1973	208	243	71	1,112	16	28	27	1,705
1974	376	465	3	1,307	80	44	15	2,290
1975	429	543	0	1,022	127	38	27	2,185

Source: U.S. Bureau of Mines

Table 4.13

Sales of LPG
in Montana by Sector
(1000 barrels)

Year	Residential and Commercial	Internal Combustion Engine Use	Industrial Usage	Other Usage	Total Usage
1960	596	125	16	0	737
1961	724	118	11	3	856
1962	659	132	27	1	819
1963	587	126	51	1	765
1964	771	102	58	0	931
1965	748	46	132	0	926
1966	891	65	209	0	1,165
1967	1,170	162	253	0	1,585
1968	1,257	188	240	0	1,685
1969	1,261	199	229	1	1,690
1970	1,044	99	179	5	1,327
1971	1,065	132	202	4	1,403
1972	1,287	199	211	7	1,704
1973	1,136	169	191	5	1,502
1974	1,207	139	119	0	1,465

Source: U.S. Bureau of Mines

Table 4.14

Capacity and Production of Natural Gas
Processing Plants in Montana

Year	Number of Plants	Input (MMCF/day)		Average Production for 12 months (gallons/day)							Journal Issue
		Gas Capacity	Gas Through put	Propane	Normal Butane	LP-gas mix	raw NGL mix	Debutanized Natural Gasoline	Other	Total Products	
1961	2	66.2	32.0	8,000	8,600	-	39,400	-	-	56,000	4/30/62
1962	2	65.8	27.4	9,400	8,000	-	37,000	-	-	54,400	3/25/63
1963	2	65.8	21.9	6,100	6,400	-	32,200	-	-	44,700	3/16/64
1964	2	55.8	23.3	6,800	7,600	-	38,700	-	-	53,100	3/29/65
1965	2	55.8	24.3	3,700	8,900	-	38,400	-	-	51,000	5/02/66
1966	5	66.8	32.9	30,800	9,200	6,000	77,240	-	-	123,240	3/20/67
1967	5	360.9	272.9	23,325	9,000	25,370	47,155	-	-	104,850	3/25/68
1968	5	107.8	82.5	32,500	9,000	15,000	54,900	-	-	111,400	4/07/69
1969	4	68.8	57.0	37,500	9,000	15,000	75,000	-	-	136,500	7/13/70
1970	7	75.8	42.7	40,800	11,000	-	60,500	35,680	-	147,980	7/12/71
1971	6	73.3	40.3	33,550	9,400	6,000	59,400	9,590	-	117,940	7/10/72
1972	4	44.3	29.6	24,900	9,400	-	43,500	9,500	-	87,390	7/09/73
1973	4	44.3	21.3	28,727	6,026	17,000	13,576	-	-	65,329	7/08/74
1974	4	45.3	20.6	30,786	8,260	-	9,000	10,466	17,000	75,512	7/14/75
1975	4	44.3	26.1	31,200	9,100	-	9,000	8,350	16,000	73,650	7/05/76

Source: Oil and Gas Journal, Annual Gas Processing Survey

V. COAL STATISTICS

Production and Consumption of Bituminous Coal and Lignite in the United States (thousand tons)

Year	Production	Average Minemouth Price ($/ton)	Consumption						Exports
			Electric-Utilities	Coking Coal	Steel & Rolling Mills	Other Use	Retail Sales	Total	
1950	516,313	4.84	88,262	103,845	10,877	166,796	84,422	454,202	25,468
1951	533,665	4.92	101,898	113,448	11,260	167,920	74,378	468,904	56,722
1952	466,841	4.90	103,309	97,614	9,632	141,341	66,861	418,757	47,643
1953	457,290	4.92	112,283	112,874	8,764	132,901	59,976	426,798	33,760
1954	391,706	4.51	115,235	85,391	6,983	103,653	51,798	363,060	31,041
1955	464,633	4.50	140,550	107,377	7,353	115,112	53,020	423,412	51,277
1956	500,874	4.82	154,983	105,913	7,189	116,106	48,667	432,858	68,553
1957	492,704	5.08	157,398	108,020	6,938	105,600	35,712	413,668	76,446
1958	410,446	4.86	152,928	76,580	7,268	94,308	35,619	366,703	50,291
1959	412,028	4.77	165,788	79,181	6,674	85,475	29,138	366,256	37,253
1960	415,512	4.69	173,882	81,015	7,378	87,749	30,405	380,429	36,541
1961	402,977	4.58	179,629	73,881	7,495	85,665	27,735	374,405	34,970
1962	422,149	4.48	190,833	74,262	7,319	87,172	28,188	387,774	38,413
1963	458,928	4.39	209,038	77,633	7,401	91,605	23,548	409,225	47,078
1964	486,998	4.45	223,032	88,757	7,394	92,318	19,615	431,116	47,969
1965	512,088	4.44	242,729	94,779	7,466	95,142	19,048	459,164	50,181
1966	533,881	4.54	264,202	95,892	7,117	99,090	19,965	486,266	49,302
1967	552,626	4.62	271,784	92,272	6,330	92,931	17,099	480,416	49,528
1968	545,245	4.67	294,739	90,765	5,657	92,445	15,224	498,830	50,637
1969	560,505	4.99	308,461	92,901	5,560	85,687	14,666	507,275	56,234
1970	602,932	6.26	318,921	96,009	5,410	83,207	12,072	515,619	70,944
1971	552,192	7.07	326,280	82,809	5,560	68,862	11,351	494,862	56,632
1972	595,386	7.66	348,612	87,272	4,850	67,294	8,748	516,776	55,997
1973	591,738	8.53	386,879	93,634	6,356	60,953	8,200	556,022	52,903
1974	601,000	NA	388,200	89,700	1/	64,600	8,800	551,300	59,900

1/ Included in Other Use.

Source: U.S. Bureau of Mines

Table 5.2

Production and Consumption of Pennslyvania Anthracite in the United States (1000 Tons)

Year	Production	Estimated Consumption			Average Minemouth Price ($/ton)
		Residential &Commercial Heating	Electric-Utilities	Other	
1950	44,077	30,161	3,609	5,299	8.90
1951	42,670	27,153	3,870	4,654	9.51
1952	40,583	25,394	3,762	5,908	9.36
1953	30,949	19,232	3,614	5,241	9.67
1954	29,084	17,279	3,166	5,179	8.52
1955	26,205	15,422	3,209	4,002	7.86
1956	28,900	15,542	3,296	4,476	8.19
1957	25,338	13,327	3,363	4,037	8.99
1958	21,171	12,309	2,786	3,601	8.88
1959	20,649	11,668	2,629	4,436	8.35
1960	18,817	10,543	2,751	3,981	7.82
1961	17,446	9,564	2,509	3,733	8.04
1962	16,893	8,328	2,297	3,621	7.94
1963	18,267	7,890	2,155	3,896	8.40
1964	17,184	7,550	2,239	4,516	8.65
1965	14,866	6,628	2,158	3,956	8.20
1966	12,941	5,622	2,192	3,455	7.78
1967	12,256	5,035	2,186	3,529	7.85
1968	11,461	4,759	2,203	3,152	8.49
1969	10,473	4,209	1,849	2,751	9.62
1970	9,729	4,042	1,897	2,309	10.83
1971	8,727	3,850	1,646	1,842	11.86
1972	7,106	2,960	1,583	1,371	12.00
1973	6,830	2,917	1,442	1,312	13.22
1974	6,617	2,577	1,498	1,369	21.87

Source: U.S. Bureau of Mines

Table 5.3

Montana Coal Production, by County
(tons)

Year	Big Horn	Carbon	Cascade	Custer	Dawson	Fallon	Garfield	McCone
1950		198,781	21,306	5,618	7,657		563	1,646
1951		152,095	18,106	2,447	7,657	93	500	
1952		122,771	2,278	1,441	6,326		413	
1953		56,942	1,086	940	4,579			
1954		19,716	2,225	1,080	3,006			59
1955		20,017	1,252	233	3,780			
1956		17,025	2,132		1,819			25
1957		15,053	2,095		2,734			965
1958		10,906	1,816		2,393			513
1959		12,814	1,923		2,502			279
1960		11,085	1,650		1,920			366
1961		9,962	1,477		1,313			1,091
1962		11,363	1,444		1,242			468
1963		12,514	570		1,477			335
1964		12,023			987			316
1965		25,684			1,217			142
1966		52,811			767			254
1967					770			196
1968					266			163
1969					160			165
1970	74,856				744			229
1971					127			
1972	792,949				340			
1973	4,159,287				242			
1974	8,332,038				373			
1975	13,331,433							

Table 5.3 Cont'd.

Year	Mussel-shell	Powder River	Prairie	Richland	Rosebud	Sheridan	Valley	State Total
1950	523,582	3,838	851	12,072	1,708,869	8,882	156	2,493,821
1951	593,030	3,772	1,950	12,956	1,488,300		329	2,281,235
1952	502,533	2,573	1,213	14,589	1,406,321	6,862	99	2,067,419
1953	370,745	1,273	900	10,478	1,421,140			1,868,083
1954	345,474	2,160	213	10,156	1,083,311	7,406		1,474,806
1955	366,086			1,444	795,955	7,541		1,196,075
1956	347,126	1,858	336	5,420	952,080	6,601		1,334,422
1957	199,652	2,557	614	1,527	164,311	5,195		394,703
1958	220,606	4,711	307	76,218	19,241	2,125		338,836
1959	135,117	1,517	313	177,972		5,429		337,866
1960	91,819	820		188,820		4,793		301,273
1961	75,060	1,760		264,108		4,077		358,848
1962	48,565	2,080		297,013		3,675		365,850
1963	31,044	2,258		285,697		2,653		336,548
1964	31,836	2,535		294,463		2,476		344,636
1965	47,592	2,107		298,315		2,191		377,248
1966	32,752	1,787		325,348		1,691		415,410
1967	33,481	2,128		326,757		1,177		364,509
1968	31,637	1,853		329,022	192,029	301		555,271
1969	30,540	2,047		306,833	685,140			1,024,885
1970	26,675	3,053		321,908	3,089,693			3,517,158
1971	112,252	2,660		325,475	6,656,612			7,097,126
1972	46,460	1,727		320,975	7,101,954			8,264,405
1973	29,837	1,444		312,785	6,225,424			10,729,019
1974	20,669	1,001		329,590	5,440,384			14,124,055
1975	16,524	1,862		300,053	8,511,226			22,162,098

Source: Montana Department of Revenue

Table 5.4

Average Minemouth Coal Prices in Montana, by County
($/Ton)

Year	Big Horn	Carbon	Cascade	Custer	Dawson	Fallon	Garfield	McCone
1950		4.77	6.47	3.23	3.00		3.00	2.04
1951		5.00	1.43	3.00	2.48	2.00	2.00	
1952		5.04	9.59	3.95	2.00		2.00	
1953		5.47	10.90	4.00	2.00			
1954		7.48	6.80	4.13	3.00			3.00
1955		3.50	8.06	1.00	1.00			
1956		7.25	6.90		1.10			1.12
1957		7.50	7.30		1.00			1.00
1958		7.56	7.75		1.00			1.00
1959		7.53	7.55		1.00			1.00
1960		7.45	7.67		1.00			1.00
1961		7.66	7.82		1.00			2.16
1962		7.69	7.79		1.00			3.59
1963		8.08	7.74		1.00			1.88
1964		8.26			1.00			1.75
1965		6.76			1.00			4.00
1966		6.49			1.00			3.08
1967					1.00			3.51
1968					1.00			4.96
1969					1.00			1.00
1970	4.62				1.00			3.57
1971					1.00			
1972	3.47				1.00			
1973	3.93				1.00			
1974	4.53				1.00			
1975	5.68							

Table 5.4 Cont'd.

Year	Mussel-shell	Powder River	Prairie	Richland	Rosebud	Sheridan	Valley	State Average
1950	4.50	2.00	2.00	3.52	1.32	3.00	3.00	2.34
1951	4.14	2.00	2.00	3.39	1.65		3.50	2.54
1952	4.35	2.00	2.00	2.49	1.98	3.30	3.50	2.76
1953	4.75	3.00	3.00	3.80	2.00			2.66
1954	4.25	3.00	3.00	4.09	2.00	3.50		2.62
1955	4.60			3.00	2.00	3.55		2.83
1956	4.95	1.10	1.10	4.30	1.95	3.56		2.83
1957	5.38	1.00	1.00	4.33	2.95	3.58		4.35
1958	4.03	1.00	1.00	1.96	2.83	5.57		3.55
1959	5.44	1.00	1.00	1.93		3.80		3.59
1960	6.40	1.00		1.94		3.80		3.56
1961	6.32	1.00		1.93		3.93		3.04
1962	4.24	1.00		1.92		4.00		2.45
1963	6.29	1.00		1.92		4.00		2.57
1964	6.58	1.00		1.92		4.00		2.58
1965	6.47	1.00		1.93		4.32		2.83
1966	6.98	1.00		1.94		4.31		2.91
1967	7.07	1.00		1.95		4.50		2.42
1968	7.58	1.00		1.95	1.63	4.50		2.15
1969	8.08	1.00		2.02	1.81			2.07
1970	6.73	1.00		2.12	1.68			1.82
1971	4.29	1.00		2.25	1.73			1.79
1972	5.41	6.00		2.43	1.83			2.03
1973	9.31	7.13		2.58	2.06			2.83
1974	6.62	9.41		3.39	2.80			3.84
1975	10.00	10.00		5.02	3.85			4.97

Source: Montana Department of Revenue

Table 5.5

Montana Coal Production and Average
Minemouth Prices by Type of Coal

Year	Production (1000 Tons)			Average Minemouth Price ($/Ton)		
	Bituminous	Lignite	Total	Bituminous	Lignite	Total
1950	2,468	52	2,520	2.30	3.37	2.33
1951	2,310	35	2,345	2.61	3.51	2.63
1952	2,039	31	2,070	2.80	3.70	2.81
1953	1,848	25	1,873	2.64	3.77	2.66
1954	1,491	NA	NA	2.79	NA	NA
1955	1,217	30	1,247	3.01	3.82	3.03
1956	820	26	846	4.11	3.70	4.10
1957	387	26	413	5.33	3.80	5.23
1958	211	94	305	5.94	2.34	4.84
1959	152	193	345	7.06	2.08	4.28
1960	113	200	313	6.87	2.06	3.79
1961	97	274	371	6.76	2.01	3.26
1962	78	304	382	6.90	1.99	2.98
1963	53	290	343	7.51	1.95	2.82
1964	46	300	346	7.40	1.95	2.68
1965	63	301	364	7.24	1.96	2.88
1966	91	328	419	7.10	1.96	3.08
1967	65	300	365	NA	NA	NA
1968	189	330	519	3.12	1.89	2.33
1969	722	308	1,030	2.18	2.03	2.13
1970	3,124	323	3,447	1.83	2.13	1.86
1971	6,737	327	7,064	1.79	2.27	1.82
1972	7,899	322	8,221	2.01	2.45	2.02
1973	10,411	314	10,725	2.83	2.60	2.82
1974	13,775	331	14,106	3.91	3.00	3.90
1975	21,620	520	22,140	5.06	5.04	5.06

Source: U.S. Bureau of Mines

Table 5.6

Distribution of Coal Produced in Montana, Wyoming, and North Dakota in 1974 and 1975, by State of Destination (thousand tons)

State of Destination	Shipments From							
	Montana		Wyoming		N&S Dakota		Total	
	1975	1974	1975	1974	1975	1974	1975	1974
Ohio		11	927	739			927	750
West Virginia		66						66
Kentucky	170	90					170	90
Illinois	9,466	6,087	2,054	1,469			11,520	7,556
Indiana	840	603	3,019	2,255			3,859	2,858
Michigan	1,265	628	3				1,268	628
Minnesota	6,254	5,142	60	70	1,116	1,371	7,430	6,583
Wisconsin	2,464	581	1,103	1,561			3,567	2,142
Iowa	372	74	1,918	2,143			2,290	2,217
Kansas			1,254	127			1,254	127
Missouri			1,006	1,055			1,006	1,055
Nebraska			1,361	1,395			1,361	1,395
Texas			136				136	
Idaho			290	235			290	235
Montana	1,206	845	9	20			1,215	865
North Dakota	121		5	6	5,521	5,788	5,647	5,794
South Dakota	57	5	352	372	1,778	53	2,187	430
Wyoming			7,855	7,074			7,855	7,074
Colorado			2,240	2,387			2,240	2,387
Nevada				1				1
Utah			14	34			14	34
California			24				24	
Oregon			64	94			64	94
Washington			16	11			16	11
Total All States	22,214	14,132	23,710	21,048	8,415	7,212	54,340	42,392
Percent of Total	41.0	33.3	43.5	49.7	15.5	17.0	100.0	100.0

Source: U. S. Bureau of Mines.

Table 5.7

Distribution of Coal in
Montana and Idaho, 1960-1973
(1000 Short Tons)

Year	Total	Electric Utility	Retail Dealers	Other Usage
1960	952	189	519	244
1961	1,045	267	478	300
1962	1,108	295	480	333
1963	1,066	287	479	300
1964	1,190	294	478	418
1965	1,075	297	432	346
1966	995	325	377	293
1967	968	328	427	213
1968	1,042	475	351	216
1969	1,063	599	296	168
1970	1,065	652	228	185
1971	1,348	782	299	267
1972	1,281	753	210	318
1973	1,395	889	211	295

Source: U.S. Bureau of Mines

Table 5.8

Distribution of Coal in
Montana and Idaho, 1974-1975
(1000 Short Tons)

Year	Region	Total	Electric Utility	Retail Dealers	Other Usage
1974	Idaho	472	0	137	335
	Montana	907	843	9	55
	Total	1,379	843	146	390
1975	Idaho	511	0	125	386
	Montana	1,252	1,203	7	42
	Total	1,763	1,203	132	428

Source: U.S. Bureau of Mines

Table 5.9

Supply of Coal Consumed in Montana
in 1974 and 1975, by Source Region
(1000 Short Tons)

Source Region	Consumption by Sector							
	Total		Electric Utility		Retail Dealers		Other	
	1975	1974	1975	1974	1975	1974	1975	1974
Montana	1,206	845	1,203	843	0	0	3	2
Colo. & N. Mexico	28	36	0	0	0	0	28	36
Wyoming	9	20	0	0	4	6	5	14
Utah	9	6	0	0	3	3	6	3
Total	1,252	907	1,203	843	7	9	42	55

Source: U.S. Bureau of Mines

VI. ELECTRICITY STATISTICS

Table 6.1

Annual Generation of Electricity in the United States
(Million KWH)

Year	Total	Hydro	Conventional Steam	Nuclear	Internal Combustion
1950	329,141	95,938	229,543	0	3,660
1951	370,234	99,767	266,826	0	3,641
1952	399,224	105,103	290,385	0	3,736
1953	442,285	105,049	333,346	0	3,890
1954	471,686	107,069	360,834	0	3,783
1955	546,404	112,721	429,740	0	3,943
1956	600,668	122,029	474,552	0	4,087
1957	631,507	130,232	497,203	10	4,062
1958	645,098	140,262	500,599	165	4,072
1959	710,006	137,782	567,651	188	4,385
1960	753,350	145,516	602,824	518	4,492
1961	792,039	151,850	633,872	1,692	4,625
1962	852,314	168,283	676,956	2,270	4,805
1963	916,793	165,755	742,780	3,212	5,046
1964	983,990	177,073	798,564	3,343	5,010
1965	1,055,252	193,851	852,655	3,657	5,089
1966	1,144,350	194,756	938,910	5,520	5,164
1967	1,214,365	221,518	980,336	7,655	4,856
1968	1,329,443	222,491	1,089,239	12,528	5,185
1969	1,442,182	250,193	1,172,481	13,928	5,580
1970	1,531,609	247,456	1,256,294	21,797	6,062
1971	1,613,936	266,320	1,303,465	37,899	6,252
1972	1,747,323	272,734	1,413,882	54,031	6,676
1973	1,856,216	271,634	1,494,901	83,334	6,347
1974	1,864,961	300,447	1,445,785	112,740	5,989
1975	1,915,824	299,814	1,439,000	171,000	6,000

Source: Federal Power Commission

Table 6.2

Generation by Fuel -- Total Electric Utility Industry in the United States */ By Years and Kinds of Fuel
Kilowatt-Hours in Millions

Year	Total Thermal **/ Generation	Coal	Percent of Total	Fuel Oil	Percent of Total	Gas	Percent of Total	Nuclear	Percent of Total
1974p	1,561,810	829,839	53.1%	299,296	19.2%	319,935	20.5%	112,740	7.2%
1973r	1,582,292	845,704	53.4%	312,805	19,8%	340,449	21.5%	83,334	5.3%
1972p	1,472,812	770,617	52.3%	272,482	18.5%	375,682	25.5%	54,031	3.7%
1971p	1,346,756	714,756	53.1%	218,162	16.2%	375,939	27.9%	37,899	2.8%
1970	1,283,271	706,102	55.0%	182,488	14.2%	372,884	29.1%	21,797	1.7%
1969	1,191,055	706,001	59.3%	137,847	11.6%	333,279	28.0%	13,928	1.1%
1968	1,106,142	684,905	61.9%	104,276	9.4%	304,433	27.5%	12,528	1.2%
1967	902,215	630,483	63.5%	89,271	9.0%	264,806	26.7%	7,655	0.8%
1966	949,072	613,475	64.6	78,926	8.3%	251,151	26.5%	5,520	0.6%
1965	860,943	570,926	66.3%	64,801	7.5%	221,559	25.8%	3,657	0.4%
1964	805,565	526,230	65.2%	56,954	7.1%	220,038	27.3%	3,343	0.4%
1963	750,742	493,927	65.8%	52,001	6.9%	201,602	26.9%	3,212	0.4%
1962	683,803	450,249	65.8%	46,983	6.9%	184,301	27.0%	2,270	0.3%
1961	639,969	421,871	65.9%	47,120	7.4%	169,286	26.5%	1,692	0.2%
1960	607,660	403,067	66.3%	46,105	7.6%	157,970	26.0%	518	0.1%
1959	572,071	378,424	66.2%	46,840	8.2%	146,619	25.6%	188	+/
1958	504,662	344,366	68.3%	40,372	8.0%	119,759	23.7%	165	+/
1957	501,108	346,386	69.0%	40,500	8.1%	114,212	22.8%	10	+/
1956	478,487	338,503	70.8%	35,947	7.5%	104,037	21.7%	--	
1955	433,786	301,363	69.5%	37,138	8.6%	95,285	21.9%	--	
1954	364,354	239,146	65.6%	31,520	8.7%	93,688	25.7%	--	
1953	337,041	218,846	64.9%	38,404	11.4%	79,791	23.7%	--	
1952	293,640	195,437	66.6%	29,750	10.1%	68,453	23.3%	--	
1951	270,532	185,204	68.5%	28,712	10.6%	56,616	20.9%	--	

*/ Alaska and Hawaii included since 1963.
**/ Excludes generation by geothermal, wood and waste.
+/ Less than one-tenth of one percent.
p = Preliminary.
r = Revised.
Source: Federal Power Commission.

Table 6.3

Consumption of Fossil Fuels for Electric Generation in the United States Total Electric Utility Industry */ By Years and Kinds of Fuel

Year	Coal (Thousand Short Tons)	Fuel Oil (Thousand 42-Gallon Barrels)	Gas (Million Cubic Feet)	Total Fossil Fuel in Coal Equivalent **/ (Thousand Short Tons)	Net Generation by Fuels **/ (Kwhr in Millions)	Heat Rate +/ (Btu per Kwhr)	Lbs. of Coal per Kwhr
1974p	392,345	536,105	3,429,230	685,116	1,449,070	10,481	0.946
1973r	388,190	559,842	3,640,756	688,043	1,498,958	10,429	0.918
1972p	351,045	493,927	3,978,673	646,308	1,418,781	10,479	0.911
1971p	327,926	396,238	3,992,981	600,496	1,308,857	10,536	0.918
1970	320,818	335,504	3,931,996	573,152	1,261,474	10,508	0.909
1969	310,641	251,027	3,487,642	517,937	1,177,127	10,457	0.880
1968	297,779	188,642	3,147,909	475,475	1,093,614	10,371	0.870
1967	274,185	161,278	2,746,352	428,165	984,560	10,396	0.870
1966	266,477	140,949	2,609,949	409,854	943,552	10,399	0.869
1965	244,788	115,203	2,321,101	367,567	857,286	10,384	0.858
1964	225,425	101,141	2,322,896	344,083	803,222	10,407	0.857
1963	211,332	93,314	2,144,473	319,840	747,530	10,438	0.856
1962	193,238	85,768	1,965,974	292,501	681,533	10,493	0.858
1961	182,121	85,736	1,825,117	275,544	638,277	10,552	0.863
1960	176,634	85,340	1,724,762	266,064	607,142	10,701	0.876
1959	168,423	88,263	1,628,509	254,525	571,883	10,879	0.890
1958	155,724	77,668	1,372,853	228,136	504,497	11,090	0.904
1957	160,769	79,693	1,336,141	232,576	501,098	11,365	0.928
1956	158,279	72,711	1,239,311	233,733	478,487	11,456	0.935
1955	143,759	75,274	1,153,280	206,929	433,786	11,699	0.954
1954	118,385	66,745	1,165,498	180,367	364,354	12,180	0.990
1953	115,897	82,238	1,034,272	178,491	337,041	12,889	1.059
1952	107,071	67,218	910,117	160,872	293,640	13,361	1.096
1951	105,768	63,945	763,808	154,498	270,532	13,641	1.142

*/ Alaska and Hawaii included since 1963.
**/ Excludes geothermal, wood, waste, and nuclear fuels.
p = Preliminary.
r = Revised.
+/ EEI estimate.
Source: Federal Power Commission.

Table 6.4

Sales of Electricity in the United States
by Electric Utilities
(million KWH)

Year	Residential	Commercial	Industrial	Other	Total
1950	74,143	48,987	142,997	21,566	287,693
1951	85,234	55,412	161,214	23,888	325,748
1952	96,059	60,568	169,248	24,510	350,385
1953	106,963	65,755	184,117	26,642	383,477
1954	120,065	71,143	180,494	27,631	399,334
1955	129,023	79,449	259,253	28,612	496,337
1956	143,810	86,873	286,497	29,578	546,757
1957	155,733	93,384	293,879	31,850	574,846
1958	169,395	100,605	286,385	32,135	588,520
1959	183,534	110,214	315,587	35,727	645,063
1960	200,798	130,333	323,891	31,472	686,493
1961	213,267	140,823	332,840	33,191	720,120
1962	231,962	152,665	358,998	31,756	775,381
1963	249,813	163,740	382,685	33,841	830,079
1964	271,842	186,884	405,049	32,284	896,059
1965	292,097	200,738	432,316	34,341	959,493
1966	316,888	217,890	463,603	36,763	1,035,145
1967	340,332	233,470	486,276	39,059	1,099,137
1968	381,570	258,097	521,133	42,071	1,202,871
1969	426,259	280,540	559,709	45,897	1,312,406
1970	466,290	306,703	570,854	48,452	1,392,300
1971	499,615	328,907	589,711	51,073	1,469,306
1972	538,609	359,265	640,978	56,309	1,595,161
1973	579,603	387,638	687,325	58,814	1,713,380
1974	578,533	383,471	687,754	58,094	1,707,852
1975	611,167	408,691	655,628	60,781	1,736,267

Source: Federal Power Commission

Table 6.5

Annual Sales of Electricity by the
Electric Utility Industry in the United States
(million KWH)

Year	Total Sales	Residential	Commercial	Industrial	Street & Highway Lighting	Other Public Sales	Rail-roads	Inter-depart-mental
1950	280,539	74,430	50,446	139,065	2,976	7,163	5,881	578
1951	318,168	85,503	57,278	157,827	3,285	7,987	5,761	527
1952	342,524	95,316	62,080	167,358	3,522	8,435	5,353	460
1953	384,244	106,610	69,274	190,010	3,780	9,011	4,976	583
1954	410,904	118,641	73,373	200,155	4,042	9,423	4,701	569
1955	480,921	131,275	80,759	249,206	4,373	10,151	4,563	594
1956	529,144	144,949	87,743	275,663	4,738	11,026	4,413	612
1957	557,829	158,349	95,142	282,734	5,090	11,774	4,143	597
1958	569,161	170,131	101,213	275,023	5,505	12,829	3,841	619
1959	626,743	186,401	112,439	303,045	5,870	14,208	4,132	648
1960	683,199	202,709	113,347	339,951	6,120	15,641	4,770	661
1961	720,728	209,021	134,864	347,427	6,762	16,438	4,685	1,531
1962	776,088	226,414	144,095	373,916	7,350	18,349	4,717	1,247
1963	830,811	241,692	166,516	388,399	7,748	20,194	4,667	1,595
1964	890,356	262,010	183,539	409,356	8,290	20,651	4,712	1,789
1965	953,414	280,970	202,112	433,365	8,782	21,675	4,652	1,856
1966	1,038,982	306,572	225,878	465,077	9,240	25,922	4,514	1,779
1967	1,107,023	331,525	242,492	486,043	9,863	29,426	4,572	3,102
1968	1,202,321	367,692	265,151	518,834	10,302	32,162	4,540	3,640
1969	1,307,178	407,922	286,686	557,220	10,772	35,801	4,531	4,186
1970	1,391,359	447,795	312,750	572,522	11,183	37,816	4,633	4,660
1971	1,466,441	479,080	333,752	592,700	11,673	39,819	4,537	4,880
1972	1,577,714	511,423	361,859	639,467	12,193	43,190	4,440	5,142
1973	1,703,203	554,171	396,903	687,235	12,836	42,340	4,186	5,532
1974	1,700,769	554,960	392,716	689,435	13,313	40,721	4,258	5,366

Source: Edison Electric Institute

Average Annual Prices of
Electricity in the United States
(Cents/KWH)

Year	Total Sales	Residential	Commercial	Industrial	Street & Highway Lighting	Other Public Sales	Rail-roads	Inter-depart-mental
1950	1.81	2.88	2.64	1.01	3.17	1.39	1.00	0.93
1951	1.78	2.81	2.55	1.00	3.08	1.27	0.99	0.91
1952	1.79	2.77	2.55	1.01	3.06	1.39	1.01	0.93
1953	1.77	2.74	2.52	0.99	3.07	1.39	1.08	1.01
1954	1.77	2.69	2.52	0.99	3.08	1.42	1.14	0.94
1955	1.67	2.64	2.47	0.91	3.05	1.42	1.15	0.96
1956	1.64	2.60	2.45	0.90	3.04	1.42	1.17	1.00
1957	1.67	2.56	2.42	0.92	3.05	1.47	1.22	1.04
1958	1.71	2.53	2.41	0.95	3.07	1.48	1.25	1.05
1959	1.69	2.50	2.37	0.94	3.08	1.47	1.28	1.05
1960	1.69	2.47	2.47	0.96	3.18	1.49	1.31	1.15
1961	1.69	2.45	2.35	0.97	3.04	1.41	1.34	0.99
1962	1.67	2.41	2.38	0.96	3.03	1.39	1.34	1.11
1963	1.64	2.36	2.27	0.94	3.04	1.36	1.32	1.06
1964	1.63	2.31	2.19	0.91	2.99	1.34	1.30	1.00
1965	1.59	2.25	2.13	0.98	2.98	1.34	1.31	1.00
1966	1.56	2.19	2.06	0.89	3.04	1.24	1.31	0.96
1967	1.55	2.16	2.04	0.90	3.11	1.19	1.33	0.67
1968	1.54	2.12	2.01	0.90	3.17	1.18	1.35	0.62
1969	1.54	2.09	1.99	0.91	3.24	1.16	1.39	0.62
1970	1.59	2.10	2.01	0.95	3.37	1.20	1.49	0.64
1971	1.68	2.18	2.12	1.03	3.51	1.29	1.70	0.68
1972	1.77	2.29	2.22	1.09	3.68	1.37	1.91	0.72
1973	1.86	2.38	2.30	1.18	3.84	1.47	2.17	0.76
1974	2.30	2.83	2.85	1.55	4.31	1.92	3.43	1.01

Source: Edison Electric Institute

Table 6.7
Electric Generating Capacity in Montana

	Existing Power Plants	Type	Owner	Year Of Completion	Name Plate Capacity (MW)	Location
1.	Madison	H	MPC	1912	9.0	Madison River
2.	Hauser	H	MPC	1912	17.0	Missouri River
3.	Holter	H	MPC	1918	38.4	Missouri River
4.	Black Eagle	H	MPC	1929	16.8	Missouri River
5.	Rainbow	H	MPC	1929	35.6	Missouri River
6.	Ryan	H	MPC	1929	48.0	Missouri River
7.	Morony	H	MPC	1930	45.0	Missouri River
8.	Cochrane	H	MPC	1957	48.0	Missouri River
9.	Mystic Lake	H	MPC	1927	10.0	West Rosebud Creek
10.	Flint Creek	H	MPC	1935	1.0	Flint Creek
11.	Milltown	H	MPC	1929	3.0	Clark Fork River
12.	Thompson Falls	H	MPC	1929	30.0	Clark Fork River
13.	Kerr	H	MPC	1938	168.0	Flathead River
14.	Noxon	H	WWP	1960	230.0	Clark Fork River
15.	Big Fork	H	PPL	1930	4.26	Swan Lake
16.	Fort Peck	H	CE	1940	165.0	Missouri River
17.	Canyon Ferry	H	BR	1954	50.0	Missouri River
18.	Hungry Horse	H	BR	1953	285.0	S. Fork Flathead River
19.	Yellowtail	H	BR	1966	250.0	Bighorn River
20.	Big Creek	H	FIP		0.36	Big Creek
21.	Troy	H	MLP	1916	4.5	Lake Creek
22.	Libby #1	H	CE	1975	105.0	Kootenai River
23.	Libby #2	H	CE	1976	105.0	Kootenai River
24.	Libby #3	H	CE	1976	105.0	Kootenai River
25.	Libby #4	H	CE	1976	105.0	Kootenai River
	Total Hydropower				1,878.92	
26.	Baker	IC	MDU		1.0	Baker
27.	Glendive	S	MDU		7.0	Glendive
28.	Lewis and Clark	S	MDU		50.0	Sidney
29.	Miles City	GT	MDU		30.1	Miles City
30.	Libby	S	MLP	1927	13.3	Libby
31.	Libby	GT	PPL	1972	26.6	Libby
32.	Frank Bird	S	MPC	1951	69.0	Billings
33.	J. E. Corette	S	MPC	1968	172.8	Billings
34.	Colstrip I	S	MPC	1975	330.0	Colstrip
35.	Colstrip II	S	MPC	1976	330.0	Colstrip
	Total Fuels				1,029.8	
	Total Fuels and Hydropower				2,908.72	

H = Hydro, S = Steam, IC = Internal Combustion, GT = Gas Turbine

Source: Bonneville Power Administration.

Table 6.8

Annual Generation of Electricity in Montana
(Million KWH)

Year	Total	Hydro	%	Total Steam	%	Coal	%	Oil	%	Gas	%	Wood & Waste	%
1950	3,136	3,107	99%	28	1%	NA		NA		NA		NA	
1951	3,304	3,259	99	44	1	NA		NA		NA		NA	
1952	3,778	3,464	92	314	8	NA		NA		NA		NA	
1953	3,719	3,424	92	295	8	NA		NA		NA		NA	
1954	4,274	4,246	99	28	1	NA		NA		NA		NA	
1955	4,696	4,679	99	17	1	NA		NA		NA		NA	
1956	5,495	5,459	99	36	1	NA		NA		NA		NA	
1957	5,215	4,969	95	246	5	NA		NA		NA		NA	
1958	4,551	4,224	93	327	7	NA		NA		NA		NA	
1959	4,934	4,720	96	214	4	NA		NA		NA		NA	
1960	5,992	5,801	97	191	3	NA		NA		NA		NA	
1961	6,780	6,499	96	281	4	263	4%	0	0%	19	1/	0	0%
1962	7,051	6,410	91	641	9	291	4%	1	1/	349	5%	0	0%
1963	6,594	6,011	91	583	9	284	4%	0	0%	299	5%	0	0%
1964	7,360	6,821	93	539	7	286	4%	2	1/	220	3%	31	1/
1965	8,882	8,389	94	493	6	285	3%	0	0%	171	2%	37	1/
1966	8,611	7,940	92	671	8	317	4%	43	1/	273	3%	38	1/
1967	9,117	8,703	95	414	5	314	3%	3	1/	41	1/	56	1%
1968	9,495	8,925	94	570	6	434	5%	10	1/	52	1/	74	1%
1969	10,442	9,447	90	995	10	735	7%	52	1/	147	1%	61	1%
1970	10,026	8,745	87	1,281	13	966	10%	14	1/	228	2%	73	1%
1971	10,653	9,595	90	1,058	10	901	8%	1/	1/	96	1%	60	1%
1972	10,689	9,444	88	1,245	12	1,079	10%	7	1/	108	1%	50	1/
1973	9,132	7,517	82	1,615	18	1,303	14%	69	1%	195	2%	48	1%
1974	11,056	9,726	88	1,330	12	1,210	11%	6	1/	98	1%	16	1/
1975	11,231	9,560	85	1,671	15	1,544	14%	17	1/	96	1%	14	1/

1/ less than 0.5

Source: Federal Power Commission

Table 6.9

Annual Sales of Electricity by the Electric Utility Industry in Montana (million KWH)

Year	Total Sales	Residential	Commercial	Industrial	Street & Highway Lighting	Other Public Sales	Rail-roads	Inter-depart-mental
1950	2,351	378	219	1,559	16	15	154	11
1951	2,437	423	238	1,566	18	19	164	10
1952	2,699	484	256	1,757	20	17	159	6
1953	3,002	501	302	1,987	20	33	154	5
1954	2,772	562	351	1,649	24	33	145	8
1955	3,658	643	389	2,407	25	34	154	6
1956	4,666	720	416	3,309	26	37	153	5
1957	4,418	782	462	2,975	28	40	127	4
1958	4,268	810	474	2,796	29	43	108	8
1959	4,074	893	512	2,468	30	55	99	17
1960	4,617	935	529	2,973	33	52	89	6
1961	4,774	953	603	3,028	33	69	83	5
1962	5,044	1,024	652	3,152	36	82	91	7
1963	5,192	1,055	715	3,190	36	102	88	6
1964	5,647	1,117	772	3,534	39	105	75	5
1965	6,228	1,172	846	3,965	40	114	85	6
1966	7,076	1,207	894	4,718	43	121	88	6
1967	6,866	1,310	936	4,338	43	144	82	13
1968	7,741	1,385	1,027	5,055	47	140	69	18
1969	9,152	1,469	1,117	6,316	51	123	57	19
1970	9,091	1,521	1,188	6,120	52	117	73	20
1971	9,214	1,614	1,254	6,079	53	113	80	21
1972	9,191	1,710	1,325	5,888	53	113	81	21
1973	8,572	1,852	1,447	5,031	55	117	52	18
1974	9,540	1,877	1,488	5,963	57	113	23	19

Source: Edison Electric Institute

Table 6.10

Average Annual Prices for
Electricity Sold in Montana
(Cents/KWH)

Year	Total Sales	Residential	Commercial	Industrial	Street & Highway Lighting	Other Public Sales	Rail-roads	Inter-depart-mental
1950	1.06	2.70	2.42	0.50	2.41	0.84	0.57	0.54
1951	1.08	2.66	2.37	0.51	2.32	0.73	0.54	0.56
1952	1.08	2.60	2.39	0.50	2.28	0.80	0.54	0.82
1953	1.03	2.52	2.42	0.47	2.35	0.52	0.54	0.88
1954	1.14	2.44	2.37	0.48	2.18	0.58	0.54	0.73
1955	0.99	2.34	2.32	0.43	2.25	0.60	0.54	0.92
1956	0.86	2.34	2.17	0.38	2.32	0.65	0.55	1.10
1957	0.93	2.28	2.08	0.40	2.30	0.66	0.54	1.38
1958	0.99	2.34	2.15	0.41	2.39	0.67	0.54	0.88
1959	1.10	2.37	2.22	0.43	2.56	0.70	0.55	0.59
1960	1.05	2.33	2.25	0.43	2.45	0.79	0.56	1.27
1961	1.06	2.32	2.18	0.45	2.70	0.74	0.55	1.70
1962	1.07	2.29	2.13	0.46	2.50	0.61	0.55	1.43
1963	1.07	2.25	2.06	0.45	2.78	0.78	0.57	1.67
1964	1.03	2.20	2.02	0.45	2.56	0.71	0.53	2.00
1965	0.98	2.12	1.93	0.44	2.75	0.70	0.59	1.67
1966	0.92	2.09	1.92	0.43	2.56	0.66	0.57	1.67
1967	0.95	2.04	1.89	0.42	2.79	0.63	0.49	1.08
1968	0.90	1.99	1.83	0.40	2.77	0.61	0.58	1.11
1969	0.88	2.10	1.93	0.41	2.75	0.57	0.53	1.05
1970	0.94	2.13	1.94	0.42	2.88	0.60	0.55	1.00
1971	0.95	2.12	1.94	0.43	3.02	0.62	0.50	0.95
1972	1.00	2.16	1.98	0.44	3.21	0.53	0.49	1.19
1973	1.16	2.21	2.04	0.53	3.27	0.60	0.58	1.67
1974	1.10	2.23	2.05	0.50	3.23	0.58	0.53	1.41

Source: Edison Electric Institute

Table 6.11

Monthly Generation of Electric Energy
in Montana by Electric Utilities
(thousand KWH)

Yr	Type	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
19	H	497,343	469,302	529,061	600,319	535,019	581,501	602,349	398,683	362,853	391,878	391,250	441,136
60	F	23,806	22,083	23,368	16,693	13,777	4,506	11,848	13,839	8,680	12,033	16,390	24,124
	T	521,149	491,385	552,429	617,012	548,796	586,007	614,197	412,522	371,533	403,911	407,640	465,260
19	H	440,592	530,209	645,777	659,043	670,666	672,807	566,144	347,667	403,224	475,107	406,009	681,174
61	F	24,212	20,048	27,152	22,535	24,857	5,271	20,435	24,294	17,902	24,409	24,633	45,596
	T	464,804	550,257	672,929	681,578	695,523	678,078	586,579	371,961	421,126	499,516	430,642	726,770
19	H	768,591	691,063	476,026	528,654	579,009	598,794	576,663	389,053	314,355	395,473	441,630	622,318
62	F	58,893	54,369	66,278	58,739	39,733	20,600	21,696	55,752	66,040	75,646	70,672	52,753
	T	827,484	745,432	542,304	587,393	618,742	619,394	598,359	444,805	380,395	471,119	512,302	675,071
19	H	695,644	548,969	511,491	556,194	570,975	498,872	536,044	338,008	323,210	420,676	352,645	658,637
63	F	60,787	44,557	51,714	51,128	31,098	16,410	44,219	58,900	55,811	59,327	50,706	58,445
	T	756,431	593,526	563,205	607,322	602,073	515,282	580,263	396,908	379,021	480,003	403,351	717,082
19	H	756,856	572,464	562,292	459,425	616,034	608,656	651,856	425,734	452,706	456,102	519,160	739,019
64	F	39,660	36,774	43,795	41,706	30,345	40,618	43,791	48,536	47,862	54,320	44,999	56,698
	T	796,516	609,238	606,087	501,131	646,379	649,274	695,647	474,270	500,568	510,422	564,159	795,717
19	H	837,770	739,037	813,797	668,092	661,773	593,252	719,460	592,258	611,204	673,711	638,819	840,029
65	F	47,792	39,980	44,944	45,039	22,524	34,807	40,186	30,263	46,879	45,331	45,960	49,046
	T	885,562	779,017	858,741	713,131	684,297	628,059	759,646	622,521	658,083	719,042	684,779	889,075
19	H	819,897	641,450	635,639	621,972	756,463	794,229	621,224	382,189	509,524	694,851	703,613	701,901
66	F	53,005	47,352	47,472	46,886	52,624	43,928	54,735	53,742	63,118	72,634	74,748	59,158
	T	872,902	688,802	683,111	668,858	809,087	838,157	875,959	435,931	572,642	767,485	778,361	761,059
19	H	719,348	680,857	733,240	641,119	709,872	805,713	841,441	599,117	659,325	713,479	690,162	908,905
67	F	52,979	48,151	40,368	30,656	30,007	23,795	22,873	30,946	33,018	31,810	31,447	38,423
	T	772,327	729,008	773,608	671,775	739,879	829,508	864,314	630,063	692,343	745,289	721,609	947,328

Type = Type of Prime Mover Driving the Generator. H = Hydro. F = Fuels. T = Total.

Table 6.11 Cont'd.

Yr	Type	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
19	H	954,165	634,390	669,126	622,495	754,433	885,901	765,446	555,941	688,032	784,012	755,798	853,581
68	F	37,667	33,580	30,385	33,729	32,261	32,562	36,684	50,999	46,922	93,948	58,729	82,479
	T	991,832	667,970	699,511	656,224	786,694	918,463	802,130	606,940	734,954	877,960	814,527	936,060
19	H	876,221	834,867	849,706	866,450	769,387	721,371	816,491	802,212	757,074	710,026	654,409	789,348
69	F	99,615	85,904	89,353	75,207	49,978	48,911	74,549	65,883	124,062	98,047	82,752	100,447
	T	975,836	920,771	939,059	941,657	819,365	770,282	891,040	868,095	881,136	808,073	737,161	889,795
19	H	628,015	560,323	591,100	690,956	770,090	894,643	809,510	748,559	771,486	805,605	626,236	848,294
70	F	136,427	97,445	113,715	80,269	61,533	49,785	59,542	66,614	107,452	144,619	175,041	188,546
	T	764,442	657,768	704,815	771,225	831,623	944,428	869,052	815,173	878,938	950,224	801,277	1,036,840
19	H	893,958	775,264	776,422	803,201	853,602	884,801	874,175	661,558	642,470	741,193	810,149	877,540
71	F	155,995	91,605	95,056	74,125	70,386	72,253	43,759	20,474	40,650	109,048	141,753	143,225
	T	1,049,953	866,869	871,478	877,326	923,988	957,054	917,934	682,032	683,120	850,241	951,902	1,020,765
19	H	901,323	755,521	822,111	905,613	889,416	891,755	804,473	591,857	602,648	759,031	745,041	775,679
72	F	138,338	116,681	85,089	82,864	42,653	74,104	100,097	103,158	65,546	131,274	132,242	172,868
	T	1,039,661	872,202	907,200	988,477	932,069	965,859	904,570	695,015	668,194	890,305	877,283	948,547
19	H	799,102	752,506	656,450	483,967	598,467	741,612	676,206	568,186	398,050	593,301	620,518	631,230
73	F	150,875	123,846	134,566	160,869	172,055	38,012	83,485	166,654	108,919	169,647	162,607	144,416
	T	949,977	876,352	791,016	644,836	770,522	779,624	759,691	734,840	506,969	762,948	783,125	775,646
19	H	814,060	820,245	938,224	957,704	795,137	792,913	903,694	715,190	665,530	743,707	799,541	778,529
74	F	136,496	122,916	117,648	100,230	89,080	23,732	92,283	111,090	119,593	138,213	137,386	141,862
	T	950,556	943,161	1,055,872	1,057,934	884,217	816,645	995,977	826,280	785,123	881,920	936,927	920,391
19	H	769,147	620,835	680,458	609,466	852,815	944,705	992,091	806,018	688,244	827,862	895,519	872,610
75	F	130,699	124,018	134,440	132,657	112,208	67,866	103,992	122,043	117,645	141,234	220,985	264,267
	T	899,846	744,853	814,898	742,123	965,023	1,012,571	1,096,083	928,061	805,889	969,096	1,116,504	1,136,877

Type = Type of Prime Mover Driving the Generator. H = Hydro. F = Fuels. T = Total.

Source: Federal Power Commission

Table 6.12

Consumption of Fuels by Electric Utilities in Montana
(Units: Coal = 1000 tons, Oil = 1000 barrels, Gas = 1000 MCF)

Year	Fuel	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1960	Coal	22.6	20.0	21.3	15.2	14.2	4.8	13.5	14.7	9.1	11.9	15.7	23.9	186.9
	Oil	0.0	1/	1/	1/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1/
	Gas	51.1	44.0	52.8	49.0	25.8	16.7	7.7	9.2	12.1	7.3	17.1	48.5	341.3
1961	Coal	24.1	19.8	25.6	21.9	25.0	5.6	20.1	23.9	18.3	23.1	24.7	30.4	262.5
	Oil	0.0	0.0	0.0	1/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1/
	Gas	30.2	24.6	18.9	18.0	8.2	7.7	7.3	9.9	6.3	17.6	9.2	198.2	356.2
1962	Coal	29.5	25.7	29.3	23.3	26.2	11.7	21.8	23.9	19.9	26.4	23.6	30.3	291.6
	Oil	0.9	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
	Gas	329.0	312.4	396.4	374.2	148.1	100.7	6.7	308.7	488.0	506.3	485.2	256.8	3,712.5
1963	Coal	31.8	27.1	26.2	27.3	29.0	3.5	24.4	25.9	17.3	25.5	22.4	25.1	285.5
	Oil	0.6	0.0	0.0	0.0	1/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
	Gas	341.7	220.0	275.3	263.3	28.6	160.2	209.0	351.2	413.7	363.8	308.2	368.3	3,303.3
1964	Coal	21.8	19.9	25.3	21.5	24.5	28.0	25.7	23.9	18.7	24.8	26.2	33.5	293.8
	Oil	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	3.6
	Gas	213.7	202.8	213.8	200.7	58.9	132.8	194.3	237.9	283.2	276.4	186.3	248.7	2,449.5
1965	Coal	29.4	24.4	28.2	28.6	21.1	23.0	25.5	12.3	26.6	26.0	27.2	23.5	295.8
	Oil	0.0	1/	0.0	0.0	0.0	0.0	0.1	1/	0.3	0.0	0.0	0.2	0.7
	Gas	199.3	176.8	187.6	173.0	5.7	115.8	163.6	179.4	185.4	185.2	191.6	228.9	1,992.3
1966	Coal	31.9	29.5	24.8	27.4	30.3	27.0	29.1	12.8	25.1	28.7	27.8	29.1	323.5
	Oil	0.5	0.0	1.3	0.4	0.3	0.1	3.3	24.0	20.8	20.9	10.6	0.0	82.2
	Gas	225.9	192.0	209.7	189.3	217.9	161.0	260.1	267.3	241.1	297.5	408.4	307.0	2,977.2
1967	Coal	29.8	29.0	28.6	24.8	27.0	19.8	20.9	27.6	28.8	27.8	27.8	33.5	325.4
	Oil	1/	2.0	4.0	0.0	0.0	0.0	0.0	0.0	1/	0.0	1/	0.0	6.1
	Gas	223.0	171.8	56.5	12.0	3.7	6.6	5.3	4.3	3.1	6.5	4.9	4.8	502.5

1/ less than 0.1

Table 6.12 Cont'd.

Year	Fuel	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1968	Coal	34.4	29.6	25.1	29.7	28.7	28.6	25.7	19.9	33.9	56.5	37.8	49.3	399.2
	Oil	0.0	0.0	0.0	0.0	0.0	1/	8.2	3.2	0.0	1/	3.3	8.1	22.9
	Gas	7.5	2.9	3.7	1.8	3.8	2.8	97.4	142.3	30.0	85.6	120.1	133.4	631.3
1969	Coal	59.6	52.9	56.9	47.6	30.3	27.8	44.8	35.6	77.6	44.2	41.5	57.8	576.6
	Oil	11.9	1.5	5.5	0.0	3.4	2.8	1.3	0.5	0.0	37.1	25.5	15.4	104.9
	Gas	149.4	91.3	115.4	82.2	138.9	177.4	123.3	86.2	92.3	178.2	149.2	136.7	1,520.5
1970	Coal	82.4	56.9	67.5	51.2	36.9	25.5	29.6	33.3	67.0	89.7	91.1	91.6	722.7
	Oil	13.0	11.3	1.4	0.0	1/	0.1	0.1	0.0	0.0	1/	0.0	1/	26.0
	Gas	159.7	126.5	106.4	94.5	160.2	197.2	294.7	141.4	70.3	106.0	457.6	614.9	2,529.4
1971	Coal	92.0	60.5	58.3	48.4	43.3	44.4	33.9	15.7	30.3	71.0	87.5	86.7	672.0
	Oil	1/	0.1	1/	0.0	1/	1/	1/	0.0	0.0	1/	0.0	0.0	0.2
	Gas	279.3	76.8	68.7	58.4	150.3	123.1	15.4	4.0	17.0	61.3	79.3	146.2	1,079.8
1972	Coal	86.6	75.1	55.2	55.7	30.8	43.1	64.3	67.1	43.9	77.8	74.4	94.7	768.7
	Oil	1.6	1/	1/	0.0	1/	1/	1/	1/	1/	0.9	0.2	14.6	17.5
	Gas	83.1	54.0	64.0	40.9	49.1	74.4	100.1	95.2	50.8	91.7	224.7	289.4	1,217.4
1973	Coal	85.6	69.0	76.3	92.1	94.3	26.0	50.9	91.6	53.0	74.7	87.6	91.5	892.6
	Oil	1.8	0.2	0.1	9.2	24.8	0.4	8.1	18.4	0.2	50.1	38.8	0.1	152.2
	Gas	326.3	233.7	198.4	185.3	177.8	99.8	0.0	191.0	166.0	271.8	178.0	139.3	2,167.4
1974	Coal	79.8	78.3	73.6	65.1	61.2	18.8	63.4	72.9	77.5	83.7	89.5	90.8	854.6
	Oil	10.6	1/	1/	1/	0.3	1/	1/	1/	1/	1/	1/	2.9	14.0
	Gas	206.6	92.8	109.6	106.7	69.8	54.7	7.2	51.5	55.5	111.8	82.8	89.0	1,038.0
1975	Coal	83.2	78.7	88.3	88.8	76.4	47.3	61.8	70.8	59.3	84.5	145.8	176.3	1,061.3
	Oil	1.9	1/	1/	1/	0.1	1/	1/	1/	14.2	17.8	10.1	18.3	62.6
	Gas	148.0	113.5	90.5	51.4	50.0	64.0	171.3	104.9	105.0	56.6	47.6	70.6	1,073.3

1/ less than 0.1

Source: Federal Power Commission

Table 6.13

Monthly Sales of Electricity
in Montana by Electric Utilities
(thousand KWH)

Year	Sector	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1960	Residential	87,817	86,156	86,172	78,700	74,016	71,708	69,122	70,021	72,281	72,788	78,160	88,423	935,364
	Commercial	40,851	40,920	40,693	37,987	38,233	37,677	37,542	39,941	40,747	39,473	40,556	44,419	479,039
	Industrial	192,702	206,245	262,319	263,102	267,841	261,080	249,175	250,586	249,098	255,737	243,306	250,196	2,951,387
	Other	15,930	16,460	17,522	17,095	16,958	16,398	16,005	19,356	18,150	18,847	17,586	18,413	208,720
	Total	337,300	349,781	406,706	396,884	397,048	386,863	371,844	379,904	380,270	386,845	379,608	401,451	4,574,510
1961	Residential	94,714	89,265	82,793	79,128	78,238	75,587	72,428	72,221	77,654	79,289	83,809	96,727	981,853
	Commercial	43,745	44,111	40,965	40,209	40,766	43,527	42,932	42,376	45,316	41,664	44,097	48,062	517,770
	Industrial	245,523	222,879	241,307	239,366	255,179	250,378	254,137	249,779	237,969	252,472	254,771	271,577	2,975,337
	Other	17,447	17,069	18,282	16,729	17,031	17,904	18,566	21,490	20,826	18,835	18,577	19,636	222,392
	Total	401,429	373,324	383,347	375,432	391,214	387,396	388,063	385,866	381,765	392,260	401,254	436,002	4,697,352
1962	Residential	103,908	101,586	94,433	87,906	78,729	80,367	75,441	75,490	79,620	80,599	86,901	96,516	1,041,496
	Commercial	48,422	48,102	45,271	44,031	43,209	43,721	44,099	45,949	45,939	44,353	47,717	49,951	550,764
	Industrial	270,801	243,237	277,876	277,380	283,922	271,608	244,388	238,120	228,811	252,574	249,926	260,819	3,099,462
	Other	19,118	18,525	21,089	21,697	19,619	19,238	20,484	23,301	22,951	23,013	21,460	23,893	254,388
	Total	442,249	411,450	438,669	431,014	425,479	414,934	384,412	382,860	377,321	400,537	406,004	431,179	4,946,110
1963	Residential	103,835	110,481	94,644	86,648	85,447	81,989	79,996	80,482	82,349	82,375	87,151	102,086	1,077,483
	Commercial	49,276	50,336	46,788	46,194	45,541	46,639	47,013	48,163	48,917	46,782	47,620	50,646	573,915
	Industrial	263,088	244,329	269,286	260,528	257,708	252,494	254,657	265,693	263,189	279,350	279,286	301,282	3,190,890
	Other	22,146	22,082	22,755	21,353	21,007	20,379	19,564	24,581	22,728	21,934	19,814	20,273	258,616
	Total	438,345	427,228	433,473	414,723	409,703	401,501	401,230	418,919	417,183	430,441	433,871	474,287	5,100,904
1964	Residential	113,972	104,130	99,613	98,215	90,238	83,836	83,917	85,367	86,431	89,147	93,850	109,881	1,138,597
	Commercial	53,376	52,679	50,467	49,839	48,678	47,549	48,107	52,939	50,029	49,286	52,242	54,615	609,806
	Industrial	269,594	278,635	307,385	287,199	310,487	305,908	295,793	296,836	299,569	307,596	299,974	284,944	3,543,920
	Other	21,883	22,113	21,961	20,066	20,042	19,200	19,516	22,078	17,852	21,559	20,456	21,846	248,572
	Total	458,825	457,557	479,426	455,319	469,445	456,493	447,333	457,220	453,881	467,588	466,522	471,286	5,540,895

Year	Sector	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1965	Residential	129,757	113,046	107,890	106,939	94,738	90,005	87,104	89,052	92,750	97,290	96,245	111,332	1,216,148
	Commercial	58,183	55,780	53,569	54,060	53,351	50,867	51,996	56,258	54,504	54,215	54,487	57,001	654,271
	Industrial	295,828	283,795	302,647	308,369	315,466	328,079	292,282	310,484	365,742	379,338	377,321	380,099	3,939,450
	Other	23,186	23,626	23,660	22,740	22,635	20,825	21,123	23,415	20,177	22,706	22,808	23,594	270,495
	Total	506,954	476,247	487,766	492,108	486,190	489,776	452,505	479,209	533,173	553,549	550,861	572,026	6,080,364
1966	Residential	121,350	124,626	113,653	103,495	99,313	93,596	91,931	93,336	96,337	96,360	105,035	122,301	1,261,333
	Commercial	58,913	60,674	57,259	55,579	55,861	55,136	57,741	59,368	59,127	58,393	59,464	60,268	697,783
	Industrial	387,237	351,127	381,773	375,749	384,072	376,720	381,588	391,139	394,768	398,414	405,337	429,369	4,657,293
	Other	24,598	25,287	26,810	24,087	23,293	21,871	22,643	24,784	21,636	24,241	22,453	24,169	285,872
	Total	592,098	561,714	579,495	558,910	562,539	547,323	553,903	568,627	571,868	577,408	592,289	636,107	6,902,281
1967	Residential	126,433	118,444	114,427	111,864	102,479	98,793	96,131	93,841	99,771	97,523	107,138	123,724	1,290,568
	Commercial	63,164	62,283	60,029	59,857	58,476	58,722	59,151	62,878	65,324	69,143	62,491	64,956	746,474
	Industrial	399,328	371,653	396,090	389,956	414,910	409,363	349,729	306,514	311,801	313,395	304,872	314,563	4,282,074
	Other	24,113	25,248	26,258	25,110	23,481	23,089	23,918	25,814	22,892	24,081	24,225	24,749	292,978
	Total	613,038	577,628	596,804	586,687	599,346	589,966	528,929	489,047	499,788	504,142	498,726	527,992	6,612,094
1968	Residential	143,663	132,768	121,232	108,338	106,581	104,089	100,963	103,557	102,645	105,823	114,265	129,362	1,373,286
	Commercial	71,463	67,767	65,410	61,562	63,963	65,534	62,364	67,865	66,533	72,710	68,798	71,000	804,969
	Industrial	349,224	301,692	313,222	359,362	415,545	412,147	410,516	463,261	453,171	470,785	514,629	518,356	4,981,910
	Other	26,187	27,093	27,845	22,534	21,925	21,883	20,467	23,614	19,135	21,451	20,882	19,966	272,982
	Total	590,537	529,320	527,709	551,796	608,014	603,653	594,310	658,297	641,484	670,769	718,574	738,684	7,433,146
1969	Residential	152,981	157,716	137,080	120,995	107,597	107,005	106,310	107,962	110,372	109,020	123,285	121,922	1,462,245
	Commercial	73,626	79,263	69,229	68,222	67,227	67,699	67,513	72,415	73,330	78,114	71,722	75,036	863,396
	Industrial	523,416	499,814	517,631	515,532	524,633	515,044	509,530	520,316	490,956	517,126	543,581	530,666	6,208,245
	Other	20,957	23,362	24,550	21,783	21,110	20,894	17,922	19,890	18,498	19,675	19,626	18,842	247,109
	Total	770,980	760,155	748,490	726,532	720,567	710,642	701,275	720,583	693,156	723,935	758,214	746,466	8,780,995

Table 6.13 Cont'd.

Year	Sector	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1970	Residential	152,800	147,131	130,734	126,382	120,747	111,014	111,686	117,988	117,328	120,147	129,342	148,732	1,534,031
	Commercial	78,481	78,370	72,151	72,549	72,646	70,889	74,235	80,235	79,091	87,240	77,183	80,540	923,608
	Industrial	535,198	507,080	517,064	521,683	524,102	499,228	509,589	489,343	464,671	493,165	497,404	470,212	6,028,739
	Other	20,146	22,016	24,030	22,554	22,192	22,161	24,076	24,744	20,763	20,118	21,019	19,914	263,733
	Total	786,625	754,597	743,979	743,168	739,687	703,290	719,586	712,310	681,853	720,670	724,948	719,398	8,750,111
1971	Residential	171,644	157,263	138,901	135,619	123,858	117,446	118,165	122,788	129,015	124,349	136,480	157,000	1,632,528
	Commercial	87,202	83,537	78,458	78,899	78,903	76,350	78,401	82,514	85,580	92,637	80,452	86,892	989,824
	Industrial	512,277	490,144	496,830	510,798	528,034	528,014	454,859	428,468	378,792	519,353	551,435	600,152	5,999,156
	Other	21,318	22,036	21,285	23,467	23,067	21,581	22,505	24,363	21,012	21,838	22,599	23,406	268,477
	Total	792,441	752,980	735,474	748,783	753,862	743,391	673,930	658,133	614,399	758,177	790,966	867,450	8,889,986
1972	Residential	196,308	174,977	159,083	139,973	129,697	129,433	126,990	125,023	134,719	131,454	146,473	174,196	1,768,326
	Commercial	99,573	98,759	85,723	82,667	80,349	85,918	84,421	84,408	91,807	91,910	87,636	96,428	1,069,599
	Industrial	383,841	367,497	547,387	532,198	531,324	484,725	494,943	480,897	475,312	492,458	470,817	398,909	5,660,308
	Other	22,537	21,683	23,962	22,315	22,021	22,468	20,535	22,039	21,171	21,633	21,567	22,610	264,541
	Total	702,259	662,916	816,155	777,153	763,391	722,544	726,889	712,367	723,009	737,455	726,493	692,143	8,762,774
1973	Residential	196,308	174,977	155,431	145,404	136,810	131,440	134,731	138,222	142,991	134,836	151,242	169,992	1,812,384
	Commercial	99,573	98,759	91,616	89,892	88,813	89,850	94,218	99,168	98,973	89,397	92,215	92,810	1,125,284
	Industrial	383,841	367,497	429,807	429,508	391,416	370,707	384,180	428,935	434,784	466,258	478,403	468,563	5,033,899
	Other	22,537	21,683	22,045	21,664	21,123	20,615	20,508	20,327	18,181	18,956	18,528	19,528	245,695
	Total	702,259	662,916	698,899	686,468	638,162	612,612	633,637	686,652	694,929	709,447	740,388	750,893	8,217,262
1974	Residential	185,102	178,463	154,353	152,674	139,598	142,545	146,882	156,208	145,167	141,631	154,677	175,550	1,872,850
	Commercial	98,697	97,157	90,171	91,900	86,088	91,539	98,340	104,597	96,879	103,383	95,650	102,055	1,156,456
	Industrial	492,483	491,482	504,374	447,331	439,410	450,886	507,271	511,013	504,551	545,501	546,527	487,813	5,861,020
	Other	20,837	21,098	21,008	19,541	19,077	17,505	16,576	16,611	14,336	16,962	13,771	15,859	213,181
	Total	797,119	788,200	769,906	711,446	684,173	702,475	769,069	788,429	760,933	807,477	810,625	781,277	9,103,507

Table 6.13 Cont'd.

Year	Sector	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1975	Residential	197,113	197,400	185,873	172,523	162,091	150,032	154,294	164,663	160,058	144,833	170,283	198,560	2,057,723
	Commercial	106,850	109,601	105,285	97,526	100,689	97,171	102,615	110,064	103,845	116,764	102,254	97,590	1,250,254
	Industrial	502,334	468,418	444,306	423,351	420,191	394,480	391,641	384,746	402,479	413,633	438,613	385,277	5,069,469
	Other	16,027	16,803	16,816	15,749	15,943	17,103	16,433	17,883	15,282	16,100	16,484	16,730	197,353
	Total	822,324	792,222	752,280	709,149	698,914	658,786	664,983	677,356	681,664	691,330	727,634	698,157	8,574,799

Source: Federal Power Commission

Table 6.14

Industrial Consumption of Electricity
in Montana in 1974 and 1975, by SIC code
(thousand KWH)

Industry	SIC Code	1974	% of Total	1975	% of Total	Percent Change
Mining		636,911	11.0	568,024	12.0	-10.8
Metal Mining	10	377,370	6.5	306,679	6.5	-18.7
Bituminous Coal, Lignite Mining	12	8,336	0.1	8,060	0.2	- 3.3
Crude Petroleum, Natural Gas	13	205,415	3.5	199,191	4.2	- 3.0
Nonmetallic Mineral Mining	14	45,790	0.8	54,095	1.1	18.1
Manufacturing		5,176,865	89.0	4,157,314	88.0	-19.7
Durable Goods		4,148,258	71.4	3,259,674	69.0	-21.4
Ordnance and Accessories	19	0	0.0	0	0.0	0.0
Lumber and Wood Products	24	235,176	4.0	250,198	5.3	6.4
Furniture and Fixtures	25	1/		1/		
Stone, Clay, Glass, Concrete	32	81,704	1.4	64,495	1.4	-21.1
Primary Metals	33	3,829,054	65.9	2,941,515	62.2	-23.2
Fabricated Metals	34	580	0.01	1,026	0.02	77.0
Machinery (Non-Electric)	35	1,342	0.02	858	0.02	-36.1
Electrical Machinery	36	0	0.0	0	0.0	0.0
Transportation Equipment	37	402	0.01	1,582	0.03	293.4
Scientific Instruments	38	0	0.0	0	0.0	0.0
Miscellaneous Industry	39	0	0.0	0	0.0	0.0
Non-durable Goods		1,028,608	17.7	897,640	19.0	-12.7
Food and Kindred Products	20	69,577	1.2	63,864	1.4	- 8.2
Textile Mill Products	22	0	0.0	0	0.0	0.0
Apparel, Other Fabric Products	23	0	0.0	0	0.0	0.0
Paper and Allied Products	26	151,047	2.6	104,152	2.2	-31.0
Printing and Publishing	27	6,414	0.1	6,794	0.1	5.9
Chemical Products	28	489,802	8.4	404,943	8.6	-17.3
Petroleum Products	29	311,767	5.4	317,888	6.7	19.6
Rubber, Misc. Plastics Products	30	0	0.0	0	0.0	0.0
Leather Products	31	2/		2/		
Total Mining and Manufacturing		5,813,777	100.0	4,725,338	100.0	-18.7

1/ Included with Fabricated Metals (34) 2/ Included with Paper Products (26)

Source: Federal Reserve Bank of Minneapolis

Table 6.15

Annual Electricity Consumption by
Mining and Manufacturing in Montana -- (kwh)

Year	Total	Mining	Manufacturing	Durable	Non-Durable
1960	2,874,418,165	239,496,008	2,634,922,157	2,158,442,805	476,479,352
1961	2,877,532,313	275,839,930	2,601,692,383	2,188,965,006	412,727,377
1962	2,982,183,534	275,217,521	2,706,966,013	2,351,750,601	355,215,412
1963	3,040,672,876	332,416,697	2,708,256,179	2,247,102,019	461,154,160
1964	3,386,930,310	440,629,745	2,946,300,565	2,415,274,578	531,025,987
1965	3,788,084,020	411,889,375	3,376,194,645	2,846,299,781	529,894,864
1966	4,488,388,146	454,693,587	4,033,694,559	3,348,700,972	684,993,587
1967	4,101,686,200	446,848,797	3,654,837,403	2,943,639,482	711,197,921
1968	4,792,103,078	435,641,885	4,356,461,193	3,575,397,130	781,064,063
1969	6,089,346,251	471,193,027	5,618,153,224	4,714,551,012	903,602,212
1970	6,020,548,870	508,293,068	5,512,255,802	4,674,300,293	837,955,509
1971	5,707,920,515	475,303,851	5,232,616,664	4,313,910,606	918,706,058
1972	5,879,454,488	598,752,164	5,280,702,324	4,354,670,379	926,031,945
1973	5,139,967,368	646,573,853	4,493,393,515	3,536,170,627	957,222,888
1974	5,831,777,000	654,911,000	5,176,865,000	4,148,258,000	1,028,608,000
1975	4,725,338,000	568,024,000	4,157,314,000	3,259,674,000	897,640,000

Source: Federal Reserve Bank of Minneapolis.

Table 6.16

Monthly Electricity Consumption by
Mining and Manufacturing in Montana -- (kwh)

Year	January	February	March	April	May	June
1960	186,663,455	201,792,885	257,139,439	259,319,904	265,662,205	256,091,185
1961	239,316,641	217,307,855	238,173,639	234,855,425	250,478,019	243,914,926
1962	258,324,664	233,917,703	270,706,222	266,962,762	278,691,557	262,753,762
1963	250,241,627	233,537,400	261,061,988	252,385,227	249,007,204	241,280,220
1964	256,939,143	267,863,079	299,237,170	279,183,297	299,564,271	297,170,480
1965	279,901,007	269,723,813	292,046,459	297,885,682	305,704,555	277,970,214
1966	373,360,031	344,321,128	374,869,599	368,252,557	374,764,286	364,111,003
1967	386,387,804	348,746,832	387,689,269	378,513,411	406,568,545	400,964,067
1968	295,084,868	287,101,982	302,716,884	351,494,463	408,386,955	404,171,341
1969	518,426,456	485,057,627	509,952,517	507,863,552	517,440,002	505,064,480
1970	520,634,826	491,876,310	507,738,294	515,439,517	514,031,069	488,807,519
1971	488,944,519	470,200,580	492,474,251	493,117,978	511,577,837	510,133,809
1972	524,493,827	510,544,065	527,779,584	517,018,122	514,034,086	502,266,456
1973	474,220,782	437,781,028	478,479,939	434,773,992	416,815,882	399,201,196
1974	460,706,000	462,187,000	482,555,000	484,040,000	485,007,000	481,939,000
1975	475,927,000	437,340,000	419,656,000	400,080,000	396,850,000	368,308,000

Year	July	August	September	October	November	December
1960	240,648,590	241,839,642	238,722,371	248,552,036	234,982,279	243,004,174
1961	242,768,172	238,410,777	224,239,293	245,210,194	242,734,946	260,122,426
1962	231,929,640	228,609,755	216,267,754	242,646,556	243,321,823	248,051,336
1963	239,705,831	246,945,050	246,739,116	268,640,481	264,408,775	286,719,957
1964	281,838,240	281,459,299	280,924,197	292,230,351	281,191,089	269,329,694
1965	279,361,931	338,013,203	350,158,199	369,841,029	362,769,328	364,708,100
1966	366,099,520	375,366,419	366,959,562	384,634,469	390,889,322	404,760,250
1967	337,161,890	296,317,955	289,789,559	287,872,039	280,048,146	301,626,683
1968	400,774,865	463,680,230	436,588,529	447,673,612	491,049,770	503,379,578
1969	502,526,763	515,578,084	498,404,220	501,775,362	514,191,964	513,065,224
1970	503,269,616	516,072,668	499,413,888	495,951,075	486,612,632	480,701,456
1971	431,909,234	406,466,621	399,499,154	484,505,613	506,978,524	512,112,395
1972	477,562,535	456,322,350	446,373,253	456,865,454	472,785,448	473,409,308
1973	415,969,879	408,633,614	406,289,756	420,797,878	416,516,201	430,487,221
1974	490,532,000	486,693,000	476,719,000	496,706,000	501,014,000	503,678,000
1975	363,013,000	367,422,000	369,050,970	377,954,000	374,309,000	378,429,000

Source: Federal Reserve Bank of Minneapolis.

Table 6.17

Monthly Electricity Consumption by Mining in Montana -- (kwh)

Year	January	February	March	April	May	June
1960	10,870,283	13,885,334	20,138,890	20,542,645	20,848,405	20,640,227
1961	22,746,571	21,659,488	23,811,157	23,204,816	23,459,648	23,210,163
1962	23,668,650	21,998,758	24,138,521	23,932,020	24,536,206	23,220,215
1963	23,698,605	22,722,211	26,940,093	27,620,595	24,477,858	22,996,612
1964	39,157,498	43,037,156	47,558,718	39,402,674	46,559,098	31,003,032
1965	32,587,203	30,266,139	34,153,511	33,386,014	34,736,909	35,039,707
1966	38,458,462	34,095,606	37,972,223	37,396,842	37,420,610	35,614,464
1967	42,161,137	40,244,690	42,558,611	41,025,815	41,756,441	40,026,809
1968	33,249,608	32,853,960	32,848,985	35,044,852	38,537,966	38,442,665
1969	38,553,292	38,661,636	36,079,653	38,356,982	38,611,446	39,840,451
1970	42,534,658	41,121,125	39,611,670	42,922,069	41,122,211	39,734,835
1971	40,748,570	42,494,055	41,811,806	43,485,596	41,623,190	43,673,390
1972	48,364,732	47,729,497	46,528,449	49,346,819	50,789,487	49,586,493
1973	52,284,896	54,525,534	52,879,896	55,581,246	54,768,924	53,438,291
1974	55,897,000	54,618,000	51,156,000	55,205,000	53,626,000	52,270,000
1975	51,680,000	48,906,000	45,719,000	48,800,000	47,715,000	47,035,000

Year	July	August	September	October	November	December
1960	21,423,002	21,889,715	21,825,404	22,376,912	21,714,428	23,340,763
1961	23,421,168	23,757,954	22,720,571	22,452,010	22,298,849	23,097,535
1962	20,942,205	21,406,662	21,416,485	23,791,994	23,491,935	22,673,870
1963	24,035,208	25,971,157	27,816,990	32,030,172	35,454,944	38,652,252
1964	30,731,004	32,829,808	32,004,082	32,024,231	32,586,020	23,736,424
1965	34,297,184	35,043,147	33,587,851	35,780,639	35,523,525	37,487,546
1966	35,958,882	36,384,017	37,889,389	40,563,472	40,486,143	42,453,477
1967	37,329,268	31,053,764	31,767,160	32,299,892	32,511,770	34,113,440
1968	33,338,062	39,058,985	39,362,661	37,924,888	37,602,791	37,376,462
1969	38,511,614	40,318,545	38,691,868	41,019,279	42,951,232	39,797,025
1970	41,070,268	42,975,363	43,744,034	43,624,747	45,119,887	44,712,201
1971	33,391,768	32,043,213	31,313,269	35,099,093	43,439,950	46,179,951
1972	49,417,779	50,560,433	49,947,414	52,845,419	52,382,027	51,253,615
1973	53,415,970	54,218,474	53,211,819	53,844,512	54,168,407	54,235,884
1974	51,218,000	52,776,000	54,024,000	50,946,000	54,480,000	50,695,000
1975	42,255,000	47,713,000	50,388,000	48,706,000	43,161,000	45,946,000

Source: Federal Reserve Bank of Minneapolis.

Table 6.18

Monthly Electricity Consumption by Manufacturing in Montana -- (kwh)

Year	January	February	March	April	May	June
1960	175,793,172	187,907,551	237,000,549	238,777,259	244,813,800	235,450,958
1961	216,570,070	195,648,367	214,362,482	211,650,609	227,018,371	220,704,763
1962	234,656,014	211,918,945	246,567,701	243,030,742	254,155,351	239,533,547
1963	226,543,022	210,815,189	234,121,895	224,764,632	224,529,346	218,283,608
1964	217,781,645	224,825,923	251,678,452	239,780,623	253,005,173	266,167,448
1965	247,313,804	239,457,674	257,892,948	264,499,668	270,967,646	242,930,507
1966	334,901,569	310,225,522	336,897,376	330,855,715	337,343,676	328,496,539
1967	344,226,667	308,502,142	345,130,658	337,487,596	364,812,104	360,937,258
1968	261,835,260	254,248,023	269,867,899	316,449,611	369,848,989	365,728,676
1969	479,873,164	446,395,991	473,872,864	469,506,570	478,828,556	465,424,029
1970	478,100,168	450,755,185	468,126,624	472,517,448	472,908,858	449,072,684
1971	448,195,949	427,706,525	450,662,445	449,632,382	469,954,647	466,460,419
1972	476,129,095	462,814,568	481,251,135	467,671,303	463,244,599	452,679,963
1973	421,935,886	383,255,494	425,600,043	379,192,746	362,046,958	345,762,905
1974	404,810,000	407,569,000	431,399,000	428,835,000	431,381,000	429,670,000
1975	424,247,000	388,434,000	373,937,000	351,279,000	349,135,000	321,273,000

Year	July	August	September	October	November	December
1960	219,225,586	219,949,927	216,896,967	226,175,124	213,267,851	219,663,411
1961	219,347,004	214,652,823	201,518,722	222,758,184	220,436,097	237,024,891
1962	210,987,435	207,203,093	194,851,269	218,854,562	219,829,888	225,377,466
1963	215,670,623	220,973,893	218,922,126	236,610,309	228,953,831	248,067,705
1964	251,107,236	248,629,491	248,920,115	260,206,120	248,605,069	235,593,270
1965	245,064,747	302,970,056	316,570,348	334,060,390	327,246,303	327,220,554
1966	330,140,638	338,982,402	329,070,173	344,070,997	350,403,179	362,306,773
1967	299,832,622	265,264,191	258,022,399	255,572,147	247,536,376	267,513,243
1968	367,436,803	424,621,245	397,225,868	409,748,724	453,446,979	466,003,116
1969	464,015,149	475,259,539	459,712,352	460,756,083	471,240,732	473,268,195
1970	462,199,348	473,097,305	455,669,854	452,326,328	441,492,745	435,989,255
1971	398,517,466	374,423,408	368,185,885	449,406,520	463,538,574	465,932,444
1972	428,144,756	405,761,917	396,425,839	404,020,035	420,403,421	422,155,693
1973	362,553,909	354,415,140	353,077,937	366,953,366	362,953,366	376,251,337
1974	439,314,000	433,917,000	424,695,000	445,760,000	446,534,000	452,982,000
1975	317,758,000	319,709,000	318,662,000	329,248,000	331,148,000	332,483,000

Source: Federal Reserve Bank of Minneapolis.

Table 6.19

Monthly Electricity Consumption by
Manufacturing of Durable Goods in Montana -- (kwh)

Year	January	February	March	April	May	June
1960	133,369,010	147,125,756	194,294,105	197,949,919	204,065,813	195,962,631
1961	179,350,382	160,761,734	177,403,667	171,534,425	189,351,692	184,648,151
1962	199,657,400	182,476,185	209,644,226	207,542,437	212,773,350	204,801,185
1963	200,248,938	181,749,496	200,400,189	189,446,773	191,023,473	177,522,016
1964	169,676,019	179,472,121	204,887,909	197,842,768	205,638,272	218,046,808
1965	201,514,938	191,980,421	211,312,165	218,672,903	223,074,435	220,198,768
1966	276,647,781	253,953,956	281,323,590	275,302,676	280,793,288	273,695,924
1967	298,081,055	261,205,897	297,702,892	289,997,700	300,033,427	294,358,747
1968	200,305,519	188,175,476	202,032,824	249,843,592	296,989,187	296,127,497
1969	405,178,682	376,137,285	394,460,107	396,855,438	400,037,054	392,636,646
1970	396,447,428	376,795,516	394,029,130	396,135,094	398,760,142	391,102,729
1971	374,797,819	346,617,339	371,260,494	370,199,200	396,421,192	393,291,817
1972	395,089,679	379,410,296	393,246,611	385,367,443	378,731,029	366,883,258
1973	344,211,927	318,291,882	340,589,100	294,991,902	288,077,621	280,612,844
1974	317,213,000	321,278,000	345,675,000	349,175,000	350,397,000	344,009,000
1975	333,046,000	304,009,000	296,361,000	290,752,000	287,751,000	265,262,000

Year	July	August	September	October	November	December
1960	188,902,738	180,551,309	174,870,219	180,730,051	176,900,970	188,720,284
1961	181,577,104	183,331,372	173,972,086	194,698,649	192,781,008	199,554,756
1962	184,969,467	182,312,400	179,012,154	198,980,118	192,371,553	197,210,126
1963	172,210,867	177,586,509	179,311,090	189,268,997	188,427,028	199,906,643
1964	212,975,653	210,544,585	203,884,026	211,268,554	200,000,794	201,037,069
1965	226,991,085	262,669,023	267,282,604	275,822,008	269,521,150	277,260,281
1966	280,952,583	282,303,031	274,318,268	285,933,579	287,778,727	295,697,569
1967	235,427,241	194,963,474	188,056,425	193,935,907	189,543,660	200,333,057
1968	303,385,123	358,478,802	345,757,793	156,771,052	386,020,763	391,509,502
1969	392,602,706	400,797,894	385,300,970	386,979,393	389,479,240	394,095,597
1970	390,438,644	395,704,714	387,158,703	391,649,206	379,929,788	376,149,199
1971	321,715,816	302,056,170	294,906,175	366,770,811	388,901,925	386,971,848
1972	360,819,927	344,406,004	332,372,605	343,277,719	336,260,052	338,805,756
1973	282,937,944	273,793,707	269,826,916	279,306,272	274,312,460	289,218,052
1974	347,966,000	348,438,000	349,280,000	360,992,000	355,954.000	357,880,000
1975	249,852,000	246,517,000	240,961,000	248,665,000	244,500,000	248,998,000

Source: Federal Reserve Bank of Minneapolis.

Table 6.20

Monthly Electricity Consumption by
Manufacturing of Non Durable Goods in Montana -- (kwh)

Year	January	February	March	April	May	June
1960	42,424,162	40,781,795	42,706,444	40,827,340	40,747,987	39,488,327
1961	37,219,708	34,886,633	36,958,815	40,116,184	37,666,679	36,056,612
1962	34,998,614	29,442,760	36,923,475	35,488,305	41,382,001	34,732,362
1963	26,294,084	29,065,693	33,721,706	35,317,859	33,505,873	40,761,592
1964	48,105,626	45,353,802	46,790,543	41,937,855	47,366,901	48,120,640
1965	45,798,366	47,477,253	46,580,783	45,826,765	47,893,211	22,731,739
1966	58,253,788	56,271,566	55,573,786	55,553,039	56,550,388	64,800,615
1967	46,145,612	47,296,245	47,427,766	47,489,896	64,778,677	66,578,511
1968	61,529,741	66,072,547	67,835,075	66,606,019	72,859,802	69,601,179
1969	74,694,482	70,258,706	79,412,757	72,651,132	78,791,502	72,787,383
1970	81,652,740	73,959,669	74,097,494	76,382,354	74,148,716	57,969,955
1971	73,398,130	81,089,186	79,401,951	79,433,182	73,533,455	73,168,602
1972	81,039,416	83,404,272	88,004,524	82,303,860	84,513,570	85,796,705
1973	77,723,959	64,963,612	85,010,943	84,200,844	73,969,337	65,150,061
1974	87,597,000	86,291,000	85,724,000	79,660,000	80,984,000	85,660,000
1975	91,201,000	84,424,000	77,576,000	60,528,000	61,383,000	56,012,000

Year	July	August	September	October	November	December
1960	30,322,850	39,398,618	42,026,748	45,445,073	36,366,881	35,943,127
1961	37,769,000	31,321,451	27,546,636	28,059,535	27,655,089	37,470,135
1962	26,017,968	24,890,693	15,839,115	19,874,444	27,458,335	28,167,340
1963	43,459,796	43,387,384	39,611,036	47,341,312	40,526,803	48,161,062
1964	38,131,583	38,084,906	45,036,089	48,937,566	48,604,275	34,556,201
1965	18,073,662	40,301,033	49,287,744	58,238,382	57,725,153	49,960,273
1966	49,188,055	56,679,371	54,751,905	58,137,418	62,624,452	66,609,204
1967	64,405,381	70,300,717	69,965,974	61,636,240	57,992,716	67,180,186
1968	64,051,680	66,142,443	51,468,075	52,977,672	67,426,216	74,493,614
1969	71,412,443	74,471,645	74,411,382	73,776,690	81,761,492	79,172,598
1970	71,760,704	77,392,591	68,511,151	60,677,122	61,562,957	59,840,056
1971	76,801,650	72,367,238	73,279,710	82,635,709	74,636,649	78,960,596
1972	67,324,829	61,355,913	64,053,234	60,742,316	84,143,369	83,349,937
1973	79,615,965	80,621,433	83,251,021	87,647,094	88,035,334	87,033,285
1974	91,347,000	85,479,000	75,415,000	84,768,000	90,580,000	95,102,000
1975	67,906,000	70,192,000	77,701,000	80,584,000	86,647,000	83,486,000

Source: Federal Reserve Bank of Minneapolis.

VII. URANIUM

Table 7.1

Estimated Uranium Ore Reserves
by States, January 1, 1975

State	Tons of Ore (Millions)	Grade of Ore (% U_3O_8)	Tons of U_3O_8
New Mexico	74.8	0.22	168,000
Wyoming	62.2	0.16	102,000
Colorado	2.9	0.28	8,000
Utah	2.8	0.21	6,000
Others:			
Arizona			
North Dakota			
South Dakota			
Texas			
Washington			
Oregon			
Montana			
California			
Alaska	24.9	0.12	31,000
Total	167.6	0.19	315,000

Source: U. S. Energy Research and Development Administration, press release, "ERDA Estimates U. S. Uranium Reserves", March 21, 1975.

Table 7.2

Active Uranium Prospecting Permits
in Montana, as of June 1, 1976

Permittee	County
Bur West	Carbon
Cominco American Incorporated	Carbon
Continental Oil Company	Jefferson
Exxon Company, U. S. A.	Carter
Felmont Oil Corporation	Carter
Gulf Mineral Resources Company	Musselshell
Kerr-McGee Corporation	Carter
Mobil Oil Corporation	Carter Choteau Liberty Powder River Toole
Pioneer Nuclear	Carter
Utah International, Incorporated	Broadwater Lewis and Clark Madison
Wyoming Mineral Corporation	Musselshell

Source: Montana Department of State Lands.

Table 7.3

Existing Uranium Leases on Public Lands in Montana

Region -- County	Acres	Company
State Lands 1/		
Beaverhead	7,107	Utah International, Inc.
	440	E. O. Larson
Broadwater	2,480	Utah International, Inc.
	1,080	Exxon Corporation
Carter	1,280	Homestake Mining Company
	1,920	Montana Nuclear Corporation
	2,092	Exxon Corporation
	6,907	Kerr-McGee Corporation
	640	Frontier Resources, Inc.
	800	Mobil Oil Corporation
	1,600	Felmont Oil Corporation
Fallon	480	Felmont Oil Corporation
Gallatin	2,080	Utah International, Inc.
Golden Valley	640	Wyoming Mineral Corporation
Jefferson	7,126	Utah International, Inc.
	400	Continental Oil Company
Judith Basin	3,437	Wyoming Mineral Corporation
Madison	1,608	Utah International, Inc.
Meagher	2,560	Utah International, Inc.
Musselshell	4,480	Gulf Oil Corporation
Total State Lands	49,157	
Federal Lands 2/	11,031	Eight Companies

1/ As of April 1, 1976, from the Montana Department of State Lands.
2/ As of December 31, 1975, (excludes Indian reservations), from U. S. Department of Interior, Bureau of Land Management, National Resource Lands Digest 1975-76.

APPENDIX

NOTES TO TABLES AND DESCRIPTION OF DATA ELEMENTS

Table

General

For all tables, details may not add to totals due to independent rounding.

NA indicates that the data is not available; p indicates preliminary data.

Reserves

2.1-2.10 Proved reserves are defined by the American Gas Association and the American Petroleum Institute to be the estimated quantity of natural gas, natural gas liquids and crude oil which analysis of geologic and engineering data demonstrate with reasonable certainty to be recoverable in the future from known oil and gas reservoirs under existing economic and operating conditions. Indicated additional reserves of crude oil are defined as those quantities of crude oil (other than proved reserves) which may be economically recoverable from known productive reservoirs in existing fields expected to respond to improved recovery techniques. Natural gas is classified in two categories based on the type of occurrence in the reservoirs, as follows:

1. Non-Associated gas is defined as free natural gas not in contact with crude oil in the reservoir.

2. Associated-Dissolved gas is the combined volume of natural gas which occurs in crude oil reservoirs either as free gas (associated) or as gas in solution with the crude oil (dissolved).

Since 1973, only the recoverable portion of natural gas in underground storage has been reported.

2.12 The demonstrated reserve base of coal includes only the measured and indicated categories of reliability. It is defined to include beds of bituminous coal and anthracite 28 inches or more thick that

Table

occur at depths to 1,000 feet, and beds of lignite 60 inches or more thick that can be surface mined. Strippable coal reserves are those beds that occur at depths generally no greater than 120 feet. The demonstrated reserve base also includes thinner and/or deeper beds that presently are being mined or for which there is evidence that they could be mined commercially at this time.

2.13 The coal reserve base is defined as in Table 2.12. All beds of bituminous coal in Montana lie in the deep reserves category.

2.14 The coal reserve base is defined as in Table 2.12. Only strippable beds of lignite are included within the definition.

2.15 The coal reserve base and deep/strippable categories are defined as in Table 2.12.

2.16 Abbreviations used in the analyses of coal samples are as follows:

A.R. = As Received.
Dry = Computations made on a moisture free basis.
M&AF = Mineral matter free basis -- coal minus the inorganic material (calculated according to the Parr formula).

Data for moisture, ash and sulfur content are given on a percentage by weight basis. Heat content (column labeled BTU) is measured in British Thermal Units per pound.

Natural Gas

All volumetric data presented in Chapter III are expressed using a pressure base of 14.73 pounds per square inch absolute (psia) at 60 degrees Farenheit (60° F). Conversions to this uniform pressure base were made by MEAC, where necessary.

3.1 "Gross withdrawal" is defined as marketed production, plus gas vented and flared, plus gas used for repressuring.

"Consumption" is defined as total gas delivered to consumers, plus extraction loss, plus lease and plant fuel, plus pipeline fuel. Total gas delivered is the sum of gas delivered to residential, commercial, industrial, electric utility, and other consumers. Industrial use includes refinery use of gas but excludes pipeline fuel. Electric utility use of gas is obtained from the Federal Power Commission. Other use consists primarily of deliveries to municipalities and public authorities for institutional heating, street lighting, etc. This sector was not reported until 1967; prior to that year, it was primarily contained within the industrial sector.

3.2 Average prices were computed as annual total value divided by annual gas volume. Wellhead price corresponds to marketed production; retail price corresponds to total consumption.

3.3 AGA data covers sales of natural gas by utilities only; it does not include sales directly from producer to end-user. For the United States direct sales make up a significant portion of total gas use, particularly in the industrial sector. For Montana, direct sales are not significant; hence, AGA "total sales" is close to the Bureau of Montana "total gas delivered". United States gas sales figures include a small amount of manufactured gas, about one percent of the total sales. At the national level, approximately one-third of the gas sales reported in the AGA "other" category are to municipalities and government authorities; the other two-thirds consists of use by electric utilities. Some electric utility use of gas is included in the industrial sector. Average heat content of natural gas sold is reported in Gas Facts from 1963 to the current issues. Natural gas sales in the United States have consistently average 1.03 MBTU/cf. Montana gas sales are reported to have averaged 1.00 MBTU/cf. for 1963-1970, 1.02 MBTU/cf. for 1971, 1973, 1974 and 1.03 MBTU/cf. for 1972.

3.4 See notes to Table 3.1.

3.5 See notes to Table 3.2.

3.6 See notes to Table 3.3.

3.7 Montana Oil and Gas Conservation Division production data is based on reports by gas producers. It excludes gas vented or flared and gas used in repressuring. It is equivalent in definition to the Bureau of Mines marketed production, except that some volumes of gas withdrawn from storage facilities in Montana may be included in the Oil and Gas Conservation Division data. Source documents for the production data use a pressure base of 15.025 psia at 60° F., which was converted to 14.73 psia at 60° F.

Montana Department of Revenue data is based on tax receipts received from industry. Average wellhead price is computed as the total value divided by the total volume of gas. Natural gas distributed is for the fiscal years ending June 30 of the year shown on Table 3.7. Source documents report data for natural gas at 15.025 psia at 60° F., which was converted to 14.73 psia at 60° F.

3.8 The U.S. Bureau of Mines reports data for the import and export of natural gas for Montana, in a similar format to that of Table 3.8.

Table

However, the Bureau of Mines data do not appear to be accurate, based on information from the companies involved. Hence, the Bureau of Mines data for interstate flows of natural gas have not been reported in this document.

3.9 Source documents used for this table report data at sales pressure base, rather than a uniform pressure. Conversion to 14.73 psia was accomplished as follows:

(A) Data for Montana-Dakota Utilities was adjusted to a uniform pressure base by Montana-Dakota Utilities;

(B) Data for the Montana Power Company assumes a pressure base in the source document of 14.9 psia. This appears to be very close for the industrial sector, but may overstate residential/commercial sales by a few percent;

(C) Data for Great Falls Gas Company assumes a pressure base in the source document of 13.28 psia.

The "other" category for sales by Montana Power Company consists of sales of natural gas to government and municipal authorities for heating. Sales of natural gas to Canada are not included in "total sales". "Other" sales by Montana-Dakota Utilities (MDU) consists of natural gas used in MDU electric generating plants at Baker, Glendive, Sidney and Miles City.

"Other" sales by Great Falls Gas Company are sales of natural gas to Malmstrom Air Force Base.

"Other utilities" include the following companies (listed in approximate descending order by volume of sales):

Cut Bank Gas Company (supplies gas to Cut Bank, Montana; about 80 percent of gas purchased from Montana Power Company).

Shelby Gas Association (supplies gas to Shelby, Montana; gas is purchased from Montana Power Company).

Consumers Gas Company (supplies gas to Ferdig, Oilmont, Sunburst and Sweetgrass, Montana; gas is purchased from Montana Power and Hardrock Oil Company through the Treasure State Pipeline Company).

Saco Municipal Gas Company (supplies gas to Saco, Montana).

Table

Kevin Gas Distribution Company (supplies gas to Kevin, Montana; gas was purchased from Montana Power in 1974, previously purchased from Big West Oil Company).

Petrolane Beta Gas Company (supplies gas to Culbertson, Montana; gas is purchased from Petrolane Supply Company).

Billings Gas Company (supplied gas to Billings area in 1950 and 1951).

Sales by the above utilities have been included entirely within the "residential and commercial" sector for "total sales".

3.10 Consumption of natural gas in 1974 by mining and manufacturing in Montana, as reported by the University of Denver Research Institute (DRI) appears to be significantly higher than total industrial use of natural gas as reported by other agencies. This would appear to be due to the definition of the industrial sector used by various agencies. The DRI data includes all consumers that have an industrial function, whereas other agencies' data appear to define the industrial sector on the basis of annual sales volume. Therefore, firms that have an industrial function but have a relatively small usage of natural gas may be included in the DRI data and excluded from the industrial sector in other agencies' data. (Note that the interruptible gas sales reported by DRI correspond well to industrial sales reported by other agencies.)

Crude Petroleum and Petroleum Projects

4.1 Crude oil throughput includes condensate, unfinished oils and other hydrocarbons processed through crude oil distillation units. Shutdown operable capacity includes: (a) capacity not in operation or not under active repairs but capable of being placed in operation within about 30 days, and (b) capacity not in operation but under active repairs which can be completed in 90 days. The Bureau of Mines source document notes that "the capacity of downstream facilities expressed in terms of gasoline output does not represent the total capacity of refineries to produce gasoline. It is a means of measuring the capacities of each of these facilities."

4.3 No attempt has been made to compile a comprehensive set of historical statistics describing the United States petroleum situation. Detailed data summaries for the nation can be found in Energy Statistics, August 1975, published by the U.S. Department of Transportation and the U.S. Bureau of Mines' Minerals Yearbook.

Table

4.4 Crude oil production figures compiled by the Montana Oil and Gas Conservation Division are also reported by the U.S. Bureau of Mines. Average wellhead prices were computed as total value of production divided by total volume produced.

4.5 Data originally reported by the Montana Oil and Gas Conservation Division have been revised, as indicated on Table 4.5, by the Montana Energy Advisory Council on the basis of further information received from individual refineries. The Oil and Gas Conservation Division data appear to have originally understated Canadian inputs and overstated Wyoming inputs to the Continental Oil refinery, for at least 1968 to 1975. Canadian inputs to the Big West Oil and Westco refineries were apparently not reported to the Oil and Gas Conservation Division. Revised data is only available for 1972 to 1975, but it is likely that significant Canadian inputs to these two refineries existed prior to 1972.

4.6 "Crude runs to stills" refers to the volume of crude oil refined. This differs from total receipts of crude oil by refineries due to changes in refinery stocks of crude oil.

4.8 The large discrepancy between the Montana Department of Revenue "gasoline manufactured" and the U.S. Bureau of Mines "production of gasoline" has not been explained at this time.

4.9 Motor fuel is defined as all gasoline covered by state motor fuel tax laws plus diesel fuel and LPG used in the propulsion of motor vehicles. Military use of motor fuel and all aviation fuel use are excluded in the Department of Transportation data. It is noted that highway use of fuels may be understated due to excessive refunds for nonhighway use of fuel.

4.10-4.13 Distillate fuel oil includes diesel fuel for both on and off highway use. Due to secondary storage facilities, sales of petroleum products do not necessarily equal consumption of those products during the same time period.

4.14 The natural gas processing plant capacity and production data reported by the Oil and Gas Journal are only approximate, due to non-reporting plants and the resultant necessity to estimate throughput and production.

For nonreporting plants, throughput is estimated as 80 percent of capacity, with production based on past performance. The large increase in capacity in 1967 was principally due to the Sumatra plant (listed as nonreporting); its capacity was estimated by the Oil and Gas Journal as 300 MMCF/day (over three times the average production rate of natural gas in Montana in 1967).

Table

Coal

5.1 "Other use" is primarily manufacturing and mining but also includes bunker and vessel fuel and railroad use of coal.

5.4 County coal production figures are taken from net proceeds tax reports, except for 1975 production figures, which were taken from coal severance tax reports.

5.5 Average price was computed as gross value of production divided by total production for each county.

5.7 Montana and Idaho were combined in the source document prior to 1974. All coal listed within the electric utility sector can be assumed to have been consumed in Montana for 1960-1973.

Electricity

Data presented for generation of electricity include only that power generated by public and private utilities; self-generated industrial electric power is excluded.

6.6, 6.10 Average annual prices were computed as total revenues divided by total sales.

6.7 Abbreviations used for power plant owners are as follows:

BR = United States Bureau of Reclamation
CE = United States Army Corps of Engineers
FIP = United States Department of the Interior, Flathead Irrigation Project
MDU = Montana-Dakota Utilities
MLP = Montana Light and Power
MPC = Montana Power Company
PPL = Pacific Power and Light
WWP = Washington Water Power

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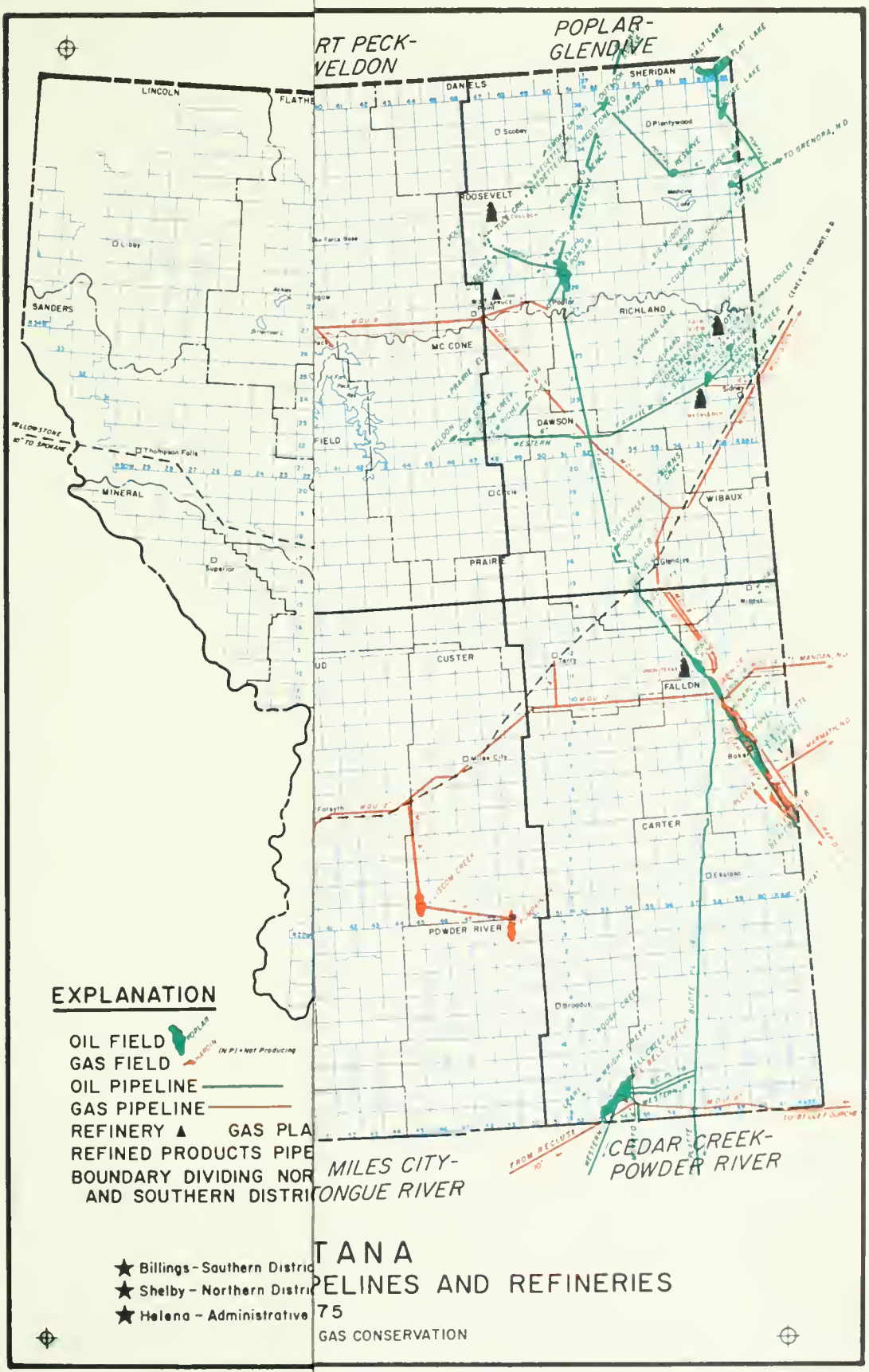
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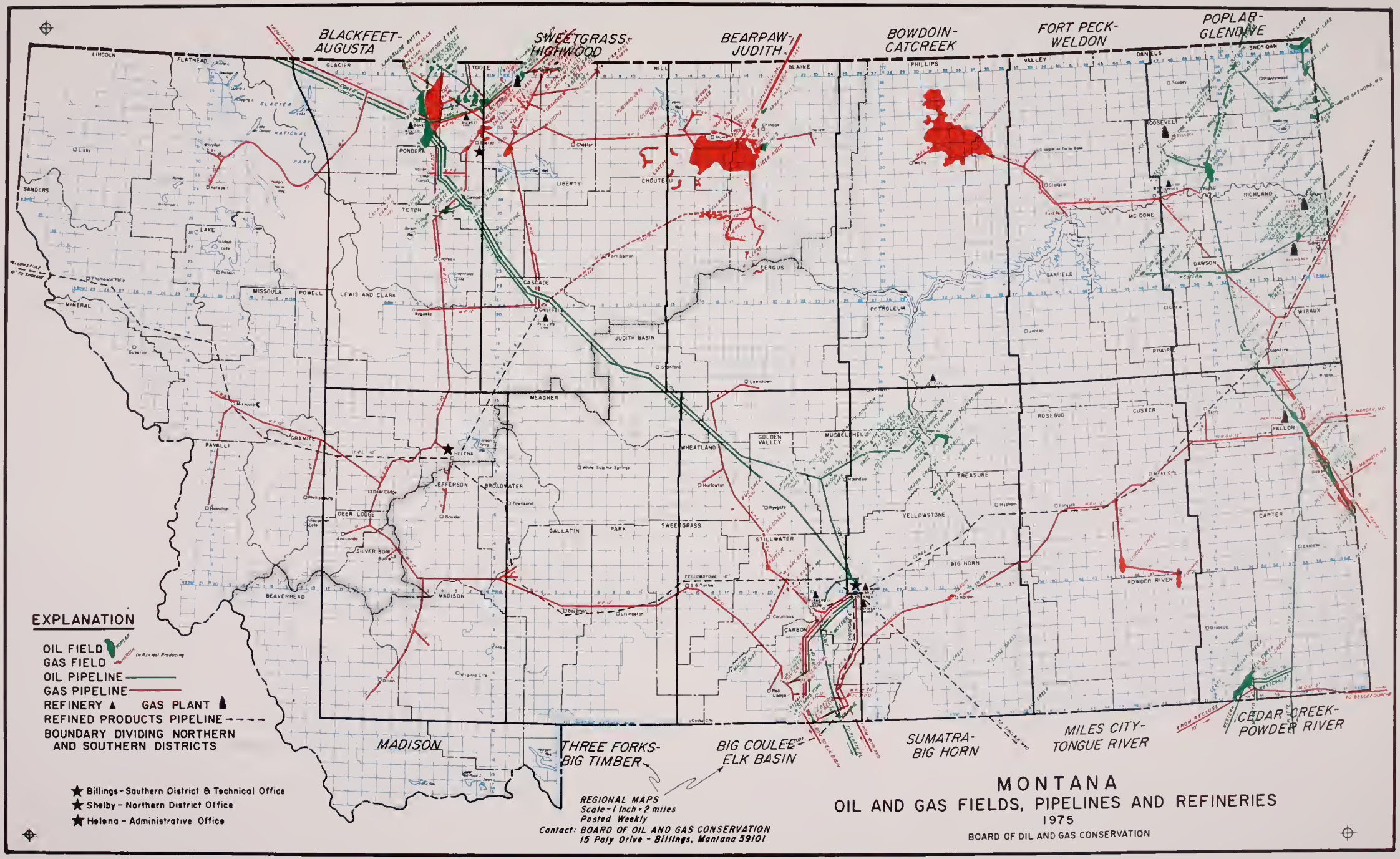
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THREE FORKS-BIG TIMBER
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